Waste Management of Illinois, Inc.
P.O. Box 1309
138th and Calumet Expressway
Calumet City, Illinois 60409
312/646-3099

A Waste Management Company

/Cook Co
Interlake Property
SF/HRS
L0316000025
ART 1 of 2

May 25, 1989

Mr. Timothy J. Murphy
Environmental Protection Specialist
Remedial Project Management Section
Division of Land Pollution Control
Illinois Environmental Protection Agency
2200 Churchill Road
Springfield, Illinois 62706

RE: Interlake Site
Hydrogeologic Investigation

Dear Mr. Murphy:

Attached is a copy of the June, 1982 Hydrogeologic Investigation for the Interlake site prepared by Canonie. This report was previously submitted to the Agency in 1983 as part of an application to develop the northwest corner of Interlake as a sanitary landfill.

Attached to this letter is a summary of wells screened in the shallow Dolton Sand and deep Silurian Dolomite. If sampling some or all of these wells is necessary as part of your investigation, we request prior notice to the sampling event. We need this notice in order to check well integrity and dedicate sampling devices, if necessary. As discussed with you on May 17, 1989, two to three weeks notice should be adequate for these purposes.

Please call me if you have any questions.

Very truly yours,

Waste Management of Illinois, Inc.

John J. McDonnell

John J. McDonnell, P.E.
Senior Environmental Engineer
Midwest Region

cc: Bill Schubert
Rich De Young
Ann Straw

524JMT

APPENDIX A
HYDROGEOLOGIC REPORT BY CANONIE ENGINEERS

JUNE 1982 CES 81-099

REPORT

Hydrogeologic Investigation
Interlake Site
Chicago, Illinois

PREPARED FOR

Waste Management, Inc.
Oak Brook, Illinois

CanonieEngineers

CanonieEngineers

Canonie Engineers, Inc.
1408 N. Tremont Road
Chesterton, Indiana 46304

Phone: 219-926-8651

CES 81-099

June 23, 1982

Ms. Tee Forshaw
Landfill Development Engineer
Waste Management, Inc.
3003 Butterfield Road
Oak Brook, Illinois 60521

Report of
Hydrogeologic Investigation
Interlake Site
Chicago, Illinois

Dear Ms. Forshaw:

Canonie Environmental has completed a hydrogeologic study for the Interlake site in general accordance with our proposal dated March 16, 1982, as amended March 31, 1982, and in accordance with instructions received during execution of the project.

This report includes a summary of our field exploration, laboratory testing, and engineering analysis. A detailed site characterization is presented together with our findings regarding the suitability of the Interlake site for landfill development.

We are available to discuss our findings with you, and to present these findings at hearings, as required. We appreciate this opportunity to provide engineering services on this phase of the project and look forward to consulting with Waste Management on the remainder of this and future projects.

Very truly yours,

CANONIE ENVIRONMENTAL SERVICES CORP.

John W. Weaver, II, P.E.

Richard F. Brissette, P.E.

JWW/RFB/css

Enclosures

TABLE OF CONTENTS

(Table of Contents Continued)

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

Canonie Environmental Services Corp. (Canonie) was retained by Waste Management, Inc. (Waste Management) to investigate the hydrogeologic conditions at the Waste Management - Interlake site and assess the suitability of the site for landfill development. As part of that investigation, Canonie researched existing information relative to the site conditions and conducted the following studies:

a) A subsurface exploration using soil test borings, piezometers, and field permeability tests.
b) Physical and chemical soil testing.
c) Water quality testing on ground water in the near surface sand and from the rock aquifer.

1.1 Background

The site was recently purchased from Interlake, Inc. by Waste Management. Thus, the site is referred to as "Waste Management - Interlake site" or simply "Interlake site" for purposes of this report. Previous to Waste Management's ownership, the site was altered extensively by sand mining and filling operations. The variety of fill material is not completely defined, but appears to be primarily slag, rubble, soil, and municipal refuse and has raised the surface elevation about five feet above its former level. The sand mining has resulted in several ponds located in the northeasterly section of the property. No filling or dumping on the site is currently allowed except for clean soil in the ponds or on the existing fill areas.

Waste Management is considering developing the site into a landfill. Waste Management intends to contain, collect, and treat the landfill leachate and not rely solely on "natural renovation" of the leachate resulting from migration through the surrounding soils. If required, the hydrostatic head of the leachate in the waste cells can be maintained lower than the external ground water levels, resulting in an inward gradient across the landfill liner.

2.0 SITE CHARACTERIZATION

2.1 General

The Interlake site is located east of Lake Calumet in Cook County, Illinois, within the corporate limits of the City of Chicago. The site is approximately 14 miles south of downtown Chicago and lies within the large industrial belt along the south shore of Lake Michigan. The nearby area has been extensively developed by heavy industry and contains a number of waste disposal sites. Nearby developments include the Paxton, CID, Land and Lakes, and Metropolitan Sanitary District (MSD) landfills; the SCA, Paxton, and MSD waste incinerators; Interlake coke plant; Wisconsin Steel; Norfolk and Western Railroad yard; and several grain elevators.

Regionally, the ground surface is flat and slightly above the level of Lake Michigan. Ground water is normally encountered less than 15 feet below ground surface. Nearby surface waters include Lake Calumet and the Calumet River, in which ocean-going ships navigate. Due to the heavy ship traffic, industrial use, and non-point pollution this water is not generally considered to be of recreational quality.

Figures 1 through 4 are aerial photographs of the Interlake site and the surrounding property. Figure 5 is a reproduction of a United States Geologic Survey (USGS) topographic map showing the regional topography and development as of 1973.

2.2 Surface Conditions

The Interlake site consists of approximately 280 acres bounded by 116th Street to the south, 110th Street to the north, Stoney Island Avenue right-of-way to the west, and the Norfolk and Western Railroad right-of-way to the east. Lake Calumet lies to the west, the MSD landfill and the Norfolk and Western Railroad yard lie directly to the north, the Interlake, Inc. coke plant lies directly to the east, and the Paxton landfill lies directly to the south. These facilities are shown on Figures 1 through 4.

The site is relatively flat. The central one third of the site is composed of swampland at a natural elevation of approximately 582 Mean Sea Level (MSL)*. The remaining two-thirds of the site is principally fill at an average elevation of approximately 587. Sand mining formed several ponds along the easterly and northeastern portions of the site. These ponds are estimated to be 15 to 20 feet deep. The regional topography is shown on Figure 5 and the site topography is shown in greater detail on Figure 9.

The surface drainage in the fill areas is generally through the porous fill to the upper sand layer, ultimately draining to Lake Calumet. The surface drainage in the lowland areas is generally through the near surface sands and ditches to Lake Calumet. Surface drainage in the lowland areas is poor due to its lower surface elevation and corresponding low gradient towards Lake Calumet. These lowlands are subject to seasonal flooding.

2.3 Subsurface Conditions

2.3.1 Geology

Pleistocene glaciation was the controlling influence on the topography and overburden deposition in northern Illinois. The soils at the Interlake site consist of over-consolidated tills left by this glaciation. Tills are characterized by physical heterogeneity and wide partical size assortment and are typically unstratified or irregularly stratified. Clay, silt, and sand sizes make up the bulk of the till; but, cobbles and boulders may be present. In the area of the site, the silts and clays predominate and are generally considered relatively impermeable. Stratified drifts of coarser materials are commonly present at the base of each till layer. These drift layers are the result of ice channels which were constantly being sheared. As a result, they are discontinuous and seldom yield large amounts of water. Figure 6 shows the regional surface geology of the unconsolidated deposits.

*All elevations in this report are referenced to Mean Sea Level.

Bedrock in the Chicago area consists of approximately 5,000 feet of Paleozoic rock. The uppermost bedrock in the Interlake site area is a Silurian aged Niagaran dolomite. The regional dip of the rock strata is to the east and the overall regional ground water flow in the rock is also to the east corresponding to the dip. The bedrock surface in the area is uneven on a large scale. Large promontories and troughs are generally encountered, not slots and pinnacles. Figure 8 shows the regional rock surface contours based on a geophysical study conducted as part of the Chicago Deep Tunnel project. The character and continuity of the bedrock is shown on Figure 7 and by the two Chicago Deep Tunnel boring logs, Figures 18 and 19 (1, 2, 3)*.

2.3.2 Soils

Our interpretation of the subsurface conditions is based primarily upon samples and data gathered from 28 exploratory test borings, rock coring, and piezometers, which were completed at the approximate locations shown on Figure 9. The subsurface conditions are graphically presented on Figures 14 through 17. The field drilling data is summarized in Table 1. The soil laboratory test results are summarized in Table 2. The physical soil testing is presented in detail in Appendix C and the geochemical soil testing is presented in detail in Appendix D.

The following subsurface description is intended to provide a general overview of the conditions encountered at the site. Detailed subsurface information is included in Appendix A. Also presented in Appendix A is a detailed description of the methods used for conducting these field operations.

The 28 soil test borings were advanced by wash drilling methods, with standard penetration testing performed at five-foot intervals. This technique was used to refusal of soil drilling methods. The refusal

*Reference number as listed in the "References" section.

material was cored in eight of the borings in order to observe its character and continuity, and to install piezometers. Twenty piezometers were installed, some in the soil test boring holes and others in augered holes near soil test borings. Piezometer details are included in Appendix B. All borings not used for piezometer installation were sealed by inserting a drill rod to the bottom of the boring and pumping grout from the bottom up.

The initial borings were left open after drilling operations so that 24- to 48-hour water levels could be recorded. However, caving occurred, requiring redrilling to assure a complete grout seal. The integrity of the seal is of paramount importance, particularly since 24 to 48 hours is an insufficient time for the water level to stabilize in the low-yield soils and rock at the site. Therefore, the remaining borings (not used for piezometers) were immediately sealed upon completion of the drilling activities. Additional piezometers were installed to allow recording of piezometric levels.

The results of our visual and laboratory classification indicate that the soils at the site are typical glacial till deposits with the exception of the near surface deposits of post-glacial sand and peat. The silty sands are medium dense, fine-grained lacustrine deposits with a range of thickness from 2.5 to 13.0 feet, averaging 5.7 feet. Areal continuity is good with the thickest sand layer encountered in the borings on the east line and a general thinning trend to the southwest. The fill is occasionally underlain by peat up to two feet thick.

The glacial till deposits that compose the majority of soils at the site underly the surface sands. The glacial tills were deposited during the Wisconsin stage, Woodfordian substage, and belong to two systems, the Tinley Moraine and the Valparaiso Moraine. The Tinley Moraine is characterized by silty clays and the Valparaiso Moraine by clayey silts to silty

clays, with occasional glacio-fluvial sand, gravel, and silt seams. The top of till contours are shown on Figure 10 and indicate that the till surface forms a shallow trough draining towards Lake Calumet. The contact between till sheets appears relatively level near elevation 560.

Stiff to hard gray silty clays, typical of the Tinley Moraine, were encountered directly below the post-glacial surficial deposits. Our borings encountered these silty clays at depths from 9.5 to 38.5 feet, top to bottom. The thickness of the silty clay varies from 6.0 to 25.5 feet with an average of about 17 feet. The borings indicate a consistent distribution of the silty clay, except toward the northeast where soils thin due to the proximity of the bedrock to the ground surface. Occasional glacio-fluvial sand layers were encountered within the till layer. The laboratory test results indicate that the silty clays comprising the Tinley till are relatively uniform. Average values show the Tinley till to be a low plasticity clay (CL, with an average PI of nine percent) that is relatively impermeable (average k^* = 1.5 x 10^{-8} cm/sec) and has an average Cation Exchange Capacity (CEC) of 9.0 milliequivalents/100 grams (meq/100g).

Underlying the Tinley Moraine are the clayey silts of the Valparaiso Moraine. Soils of this system were encountered from depths of 17.0 to 104.5 feet top to bottom. Thickness of the clayey silt varies from 3.0 feet at Boring B-7 to 66.0 feet at Boring B-1. Our borings indicate a thinning trend toward the northeast corresponding to the rise in bedrock. This gray clayey silt is stiff to hard and contains traces of coarse sand and some glacio-fluvial sand, gravel, and silt lenses. Occasional cobbles and boulders were also encountered in this unit. Decomposed bedrock and gravel were sometimes found at the Valparaiso till-bedrock contact.

*k = coefficient of permeability

The Valparaiso till can be typified as a low plasticity silty clay to clayey silt (CL-ML, with an average PI of six percent) that is relatively impermeable (average k = 2.1 x 10^{-8} cm/sec), with an average CEC of 7.7 meq/100g.

These laboratory results compare well with other work done on similar soils in the area.

2.3.3 Bedrock

Silurian dolomite from the Niagaran series, Racine formation was cored in eight borings after soil drilling methods met refusal. This medium to hard, gray, fossiliferous, fine-grained dolomite is vuggy in reef formations and argillaceous, relatively pure, and massive in inter-reef layers. Vugs containing silica, pyrite, and asphaltum infillings are common. Rock cores along the eastern property line appeared slightly to highly weathered, fossiliferous, and vuggy with silt and shale partings. Cores on the west are medium hard, fresh to slightly weathered, fine-grained, and massive.

We have, in general, interpreted refusal to soil drilling methods as the bedrock surface. This has been confirmed in eight borings by coring. However, refusal to soil drilling methods can result from boulders, cemented soil, "floating" rock slabs, and bedrock. Also, the surface of carbonaceous rock such as dolomite, can vary erratically between borings. Refusal depths of 71.5 feet and 80.2 feet were recorded in Boring B-13 and in augered piezometer Boring B-13M, respectively, which are within 40 feet of each other. In the same general area, rock was cored in augered piezometer Boring SS-2D. About three feet of rock was cored from 76.5 to 79.3 feet, then five feet of silt was encountered, and then rock was cored from 82 feet to the boring terminus of 101 feet. However, our refusal depths generally show a consistent slope of the bedrock surface and generally correlate with the Vibroseis geophysical exploration (Figure 8), which

indicates only large scale rock surface variations. Based on this information, we have presented our inferred rock surface contours in Figure 11, which show the bedrock surface dipping from elevation 562.5 in the northeast corner to elevation 484.3 in the southern portion of the site.

2.4 Subsurface Hydrogeololgy

Twenty piezometers were installed in the near surface sands, glacial drift seams, and bedrock aquifer. Piezometer installation details are included in Appendix B. Water level measurements taken in these piezometers were used to construct the piezometric surface contour maps shown on Figures 12 and 13.

2.4.1 Unconsolidated Deposits

Shallow ground water in the near surface sand unit of the unconsolidated material flows to the west-southwest towards Lake Calumet. The path taken by the ground water in the near surface sands does not intersect industrial or residential areas (Figure 2), but flows directly into Lake Calumet forming a local sink for shallow ground water drainage in the entire area. The shallow ground water is then transported via the Calumet River directly to Lake Michigan. The gradient across the site is low to near stagnant, particularly in the central lowland area. This low gradient is below the operating range of the K-V meter and so the K-V meter was not used in this investigation.

Permeability tests were conducted on the Tinley and Valparaiso soils. Laboratory tests were conducted on both undisturbed and remolded samples. Field permeability tests were conducted on the in situ soils.

The laboratory tests indicate both silty clays and clayey silts are relatively impermeable with coefficients of permeability less than 1×10^{-7} cm/sec. A recompacted sample of the Tinley till yielded $k = 6.6 \times 10^{-9}$ cm/sec, while a recompacted sample of the Valparaiso till yielded $k = 5.0 \times 10^{-8}$ cm/sec.

Field permeability tests were conducted in the auger borings for piezometers B-13M, B-17M1, and about 40 feet north of Boring B-3. Tests in the piezometer borings were conducted to check for zones of high hydraulic conductivity, particularly in the sandy and gravelly seams. The tests were all conducted to the limit of the equipment accuracy. No flow was measured, indicating k values generally less than 10^{-6} cm/sec. Detailed test results are presented in Appendix B. This indicates the more granular seams encountered by these tests are saturated lenses of limited extent without direct connection to the shallow ground water in the upper sands or to the rock aquifer.

Piezometers were installed in several of the silt and sand seams. The piezometric levels correspond to the levels of the shallow ground water, not the rock aquifer levels, indicating the seams are not connected to the rock aquifer. Two longer term tests, using volumetric measurements, were conducted near Boring B-3 and indicate a permeability less than 9×10^{-8} cm/sec for a 11.5-foot test hole in the Tinley till and $k = 9 \times 10^{-9}$ cm/sec for a 30-foot test hole in the Valparaiso till.

2.4.2 Consolidated Deposits

The "deep aquifer" system, in which piezometers wells were installed, is the bedrock aquifer composed of Niagaran dolomite directly underlying the glacial drift and overlying the Maquoketa formation. The regional flow in the Niagaran dolomite is to the east with major recharge at surface outcrop areas to the west and south of the South Chicago area. Neither Lake Calumet nor Lake Michigan is directly connected to this aquifer. As shown

on Figure 13, observations indicate ground water flow across the site to the south, then turning to the east. We believe this variation from the regional flow pattern is due to the local rock surface variations which may allow nearby recharge. The profile on Figure 14 shows the rock within 25 feet of the ground surface at the northeast corner of the site. Less than 10 feet of clay separates the rock from the shallow ground water in the upper sand layers at this point. A local recharge zone may exist just northeast of the Interlake site and this recharge likely accounts for the variation in flow direction shown on Figure 13.

Prior to concentrated urbanization in the area, the Niagaran dolomite was used as a low yield aquifer for potable water supply for individual dwellings. Water migration in the Niagaran dolomite is controlled by solution features and by fractures resulting in sporadic yields (4). It is not generally used in South Chicago or Northern Lake County, Indiana for this purpose today, as it has been replaced by deeper, more prolific aquifers or water from Lake Michigan (5).

Figures 1, 3, and 5 show the surface development downgradient (for the rock aquifer) of the Interlake site. Heavy industrial and municipal developments are located nearby. Based on our inquiry, the closest significant usage of the ground water from the Niagaran dolomite (downgradient of the Interlake site) is in the less urbanized or rural areas of Lake and Porter counties in Indiana, over 20 miles away (6).

The Ordovician Maquoketa is a silty shale that separates the shallow Silurian aged Niagaran dolomite aquifer from deeper Cambrian-Ordovician aquifer systems. The three major aquifers in these deeper systems are the Glenwood-St. Peter, Ironton-Galesville, and Mt. Simon sandstones. The Galena-Platteville dolomite forms the uppermost boundary of the Cambrian-Ordovician system. The Glenwood-St. Peter sandstone, directly beneath the

Galena-Platteville, varies in thickness from 190 to 275 feet. Water utilization in this aquifer is high in areas requiring less than 200 gpm. Minor aquifers include the Prairie du Chien, Eminence-Potosi, and Franconia formations, directly underlying the Glenwood-St. Peter aquifer. Yield is erratic, varying greatly with location.

The major water producing formation within the Cambrian-Ordovician system is the Ironton-Galesville sandstone. This is the major potable water aquifer in the area. The Franconia lies directly above the Ironton-Galesville, while the Eau Claire siltstone-dolomite lies below, separating the Cambrian-Ordovician and Mt. Simon systems. Wells within the Mt. Simon systems seldom extend more than a few hundred feet due to decreasing water quality with depth.

The two deep bedrock aquifer systems (Cambrian-Ordovician and Mt. Simon) are recharged primarily from surface outcrop points to the west and south of the South Chicago area or where they are in direct contact with the overlying unconsolidated material. Regional flow is to the east, although pumping may cause variations in the flow direction.

2.4.3 Ground Water Quality

The quality of the shallow ground water in the near surface sands and in the rock aquifer was analyzed for priority pollutants and primary drinking water standards. A summary of the more significant parameters is presented in Table 3. Sampling procedures and detailed test results are discussed in Appendix B.

The shallow piezometers were installed by augering the hole so that no drilling water was injected into the soil surrounding the piezometer.

However, in the deep piezometers extending into the rock aquifer, substantial drilling water was injected into the rock surrounding the piezometer. Accordingly, when interpreting the ground water quality of the rock aquifer, the chemical concentrations should be compared to those found in the drilling water (which was obtained from a fire hydrant near the site). For instance, benzene found in the rock aquifer is likely due to the drilling fluid. It was not found in piezometer ST-2D; however, ST-2D is in an area of relatively high ground water gradient and the drilling water may have been flushed from the piezometer by the natural flow of ground water.

The quality of the shallow ground water is relatively poor, containing both chloride and cyanide concentrations above drinking water standards. This quality of water conforms to that expected in an area with fill from a coke plant.

The water in the rock aquifer is very hard, but contains levels of chloride and sulfate ion (a general indication of ground water degradation) that are below drinking water standards. Some of the cyanide concentrations are in excess of drinking water standards. The distribution of cyanide concentrations indicates it may be coming from a suspected recharge zone northeast of the Interlake site, although no clear patterns exist.

2.5 Well Survey

A well survey within a one-mile radius of the proposed landfill site was conducted in compliance with the State of Illinois Environmental Protection Agency's instruction for permit applications for a solid waste management site. During the survey, the Illinois State Water Survey, State Department of Health, Illinois Environmental Protection Agency, and the City of Chicago Department of Water were contacted.

The closest operating off-site well found during the survey is located 3.25 miles to the south of the Interlake site at the Maynoch Tavern.

A 300-foot deep well is located on the Interlake site as shown on Figure 5. Details of this well are not known. This well is under Waste Management's control.

3.0 SITE SUITABILITY FOR LANDFILL DEVELOPMENT

3.1 General

The technical suitability of a landfill site depends upon its ability to contain wastes or renovate them as they leach out. These characteristics may be inherent or may be enhanced through site modifications. The extent of the modifications is usually a large part of the development costs which, in turn, determines the feasibility of landfill development.

The containment and renovation of leachate are the most important functions of the landfill. The control of solid landfill products is largely obtained by using standard operating procedures; however, the containment of the liquid phase is highly dependent upon the site characteristics. The ability of the on-site soils to contain and attenuate the flow of leachate, either in situ or in a recompacted state, is critical.

The liquid phase (leachate) may be transported away from the landfill by one of two primary mechanisms, ground water or surface water. The control of surface water transport is generally part of the landfill facilities design. Surface water control structures can be designed to prevent flooding and to collect and divert rainwater from the face of the landfill and discharge off-site. A separate surface water control system can be designed to collect and treat water that becomes contaminated.

Control of ground water moving into and out of the landfill is usually governed by the subsurface characteristics of the site. It is primarily a function of the permeability and hydraulic gradient. The hydraulic gradient can be controlled by design or operations, but unless synthetic membrane liners are used, the permeability is a function of the soil. It is the permeability characteristics that most often determine the technical suitability of a landfill site. Also important is the resistance of the soil to degradation due to geochemical reactions to the leachate.

In this section, we discuss the physical and chemical properties of the site and relate these properties to the ability to contain or renovate landfill leachate. The subsurface characteristics of the Interlake site are compared to accepted and proposed standards for landfill design. Data collected during the April and May, 1982, field and laboratory program form the basis for this comparison. Additional data from published literature is used to support the site specific data.

3.2 Soil Properties - Physical

The overburden thickness at the Interlake site varies from 25 feet in the northeast corner to over 100 feet at the southwest corner of the site. The soils are primarily glacial tills and are very stiff to hard clayey silts and silty clays. The soils are only slightly to moderately plastic indicating a workable soil that can be recompacted to form a landfill liner. A few non-plastic silt zones encountered during the field investigation are confined mainly to the Valparaiso till formation. These non-plastic zones may be controlled by ordinary mixing with the clayey soils during excavation into the till or they may be segregated in separate stockpiles.

The tills also contain occasional sand lenses with limited lateral extent. In situ permeability tests have indicated that these lenses are essentially saturated and have no connection to outside sources. These materials and the near surface sand are not suitable for liner construction but may be used as miscellaneous fill, daily cover, and similar uses.

3.2.1 Properties of Saturated Tills

Permeability is the property of a soil that controls the movement of liquid or gases. Finer grained soils such as clay and silt have lower permeabilities than coarser sands and gravels. Accordingly, our attention has

been focused on the glacial clay tills. The more permeable sand formations overlying the till are not considered to be suitable for use in landfill liner applications.

Laboratory permeabilities were determined for the glacial tills at the Interlake site. The laboratory permeabilities varied between 5.0×10^{-8} cm/sec and 5×10^{-9} cm/sec. In order to obtain measureable inflows in reasonable lengths of time, the water was injected under pressure. All permeabilities were determined using fresh water as the permeant. Appendix C includes a description of the laboratory tests. Two tests were performed on one shelby tube sample to assess the reliability of the testing procedure and repeatability of data for the site soils. The results were 1.5×10^{-8} and 3.0×10^{-8} cm/sec, which represents a good agreement. Our experience indicates that these types of permeability tests, in the less than 10^{-7} cm/sec range, are accurate to plus or minus one half an order of magnitude.

Permeability values obtained in the laboratory measure the apparent permeability of a soil. The actual mass permeability of the in situ soil mass may be greater than the apparent permeability due to the presence of seams or fractures. In the case of granular soils, apparent permeabilities and in situ permeabilities will be approximately the same provided the grain-size distribution used in the laboratory is representative of the actual soil in the field. However, with stiff clays and rock, a small sample used in the laboratory will not include the fissures or fractures which form the preferential flow paths under field conditions.

The mass horizontal permeabilities of the tills were measured in the field by testing 10 to 30-foot intervals at the bottom of the borehole. In the laboratory, apparent vertical permeabilities were measured on undisturbed and recompacted till samples. The field test procedures are less precise

than laboratory testing procedures. While conducting the field permeability tests, we observed very little or no flow and, therefore, our results represent the maximum permeability that could occur based on the accuracy of the testing equipment and testing procedures. Within the accuracy of the procedure, we were able to measure a permeability of less than 9 x 10^{-9} cm/sec in a 30-foot long test hole in the Valparaiso till and a permeability of less than 9.0 x 10^{-8} cm/sec in the Tinley till. The greater depth of the Valparaiso till permitted higher testing pressures and correspondingly more accurate results. The occurrence of horizontal seams or fractures of high hydraulic conductivity were not encountered. However, vertical fracturing in the tills has been observed (7), particularly locally in the Valparaiso formation with its low clay content and hard consistency. However, the permeability along fractures in the tills was not determined in detail during this scope of work and will be assessed based on published literature.

The hydrogeologic characteristics of a fractured glacial till in Manitoba, Canada have been investigated (8). The Manitoba till had a clearly defined vertical fracture system located by digging test pits and the bulk vertical permeability from field pumping tests was found to be about two orders of magnitude greater than the apparent vertical permeabilities measured in the laboratory using an odeometer.

Since the potential for vertical fissuring in hard clay tills such as the Valparaiso formation is indicated, the use of recompacted clay liners should be considered as an option for the Interlake site. The construction operations of excavating and compacting soil destroys the fracturing system. Two laboratory permeability tests were performed on remolded, recompacted soils from both the Valparaiso and Tinley tills. The results are 5 x 10^{-8} and 6 x 10^{-9} cm/sec, respectively. Both of these values are less than the 1 x 10^{-7} cm/sec limit for soil liner in a Class I landfill suggested by various regulatory agencies. Accordingly, should fracturing occur, it can be mitigated with a liner of recompacted on-site soils.

The permeabilities of the soil to fresh water were determined during this study. The effects of anticipated leachate should be determined during design studies for the facility. Due to the clay mineralogy of the Valparaiso and Tinley tills, the effect of leachate may reduce the permeabilities of the clay even lower than the water permeability. This is discussed in Section 3.2.

The gas permeability of soil is higher than its liquid permeability. This is due to the slip phenomenon, whereby, the gas molecules, because of their size, move through soil with less total boundary drag than liquids. The permeability of gas at a specific pressure can be related to that of liquid by the Klinkenberg formula (9).

$$K_g = K_l(1 + b/Pm)$$

where:

K_g = permeability for gas
K_l = permeability for liquid
b = Klinkenberg constant
Pm = mean gas pressure, in psi

The Klinkenberg constant is dependent on the K_l value of the soil and is equal to three for a liquid permeability of about 10^{-8} cm/sec. If we assume a gas pressure of 5 psi, the gas permeability of the soil is about 1.6 times the liquid permeability. As the gas pressure decreases, the factor increases raising the gas permeability. As the gas pressure drops, the driving force to move the gas through the soil also drops, reducing the actual migration of gas into the soil.

3.2.2 Properties of Unsaturated Tills

Although the in situ tills may be saturated with water, the recompacted till liner may have to be air dried to obtain maximum compaction and

could exhibit properties of an unsaturated soil. The permeability of an unsaturated clay or silt is directly dependent upon both moisture content and pressure head. In unsaturated soils, the pressure head is negative since the pore fluid is a mixture of air and liquid with many surface tension interfaces. The prediction of water movement in an unsaturated soil system is difficult and depends upon a complete knowledge of the moisture content, pressure head influences, and permeability.

The unsaturated permeability is less than the saturated permeability of the same soil. The total flow through a compacted liner will obtain its maximum rate only after total saturation has been re-established in the liner soil. The rate at which this reestablishment of saturation occurs is dependent upon two other effects, capillarity and osmosis.

In fine grain soils, liquids will be drawn into the unsaturated soil by capillary rise. For silts and clays, theoretical capillary rises of one to 13 feet have been reported (10). This indicates that capillary effects could draw water through a ten-foot clay liner. However, the low permeability of clay controls the rate at which the theoretical capillary rise is established. A method for predicting the time required to establish the full capillary effect is not available.

Osmosis, the development of a pressure differential across a clay liner, may result from differences in ionic concentrations of water on each side of the liner. If this occurs, the pressure differential will produce flow from the lower concentration solution to the higher concentration solution, since the leachate in a landfill usually has a higher ionic concentration than the surrounding ground water. The osmotic pressure differential will tend to move clean water into the landfill.

The unsaturated properties of the glacial tills at the Interlake site should be expected to offer as good or better control of water movement out of the landfill than the saturated properties measured during this program. Estimates of the total time required for reestablishment of saturated conditions in recompacted tills is beyond the scope of this report.

3.3 Soil Properties - Chemical

The primary geochemical barriers to the migration of contaminates from a landfill are the adsorption processes-ion exchange, ion filtration, and solubility limits of reactants. Adsorption processes are by far the more important in most cases. All three processes are dependent upon the characteristics of the soil and its pore fluid.

The clay mineralogy of the Valparaiso and Tinley tills, as presented in Appendix D, indicates a carbonate-mineral dissolution origin with illite being the major clay mineral. The soil also contains a sizable amount of kaolinite, with the combined percentage of illite and kaolinite being about 75 percent. The tills also contain minor percentages of the clay minerals chlorite, smectite, and chloritized vermiculite, along with some quartz. Calcium is the predominant cation and is responsible for the slightly alkaline soil pH of 7.5 to 8.0. The cation exchange capacity is typical of illitic or kaolinitic clay averaging about 8 meq/100g.

The chemical till properties are typical of midwestern tills which generally have calcium and magnesium as the dominant cations. The dominant anion is usually bicarbonate, a product of the dissolution of calcite and dolomite. Waters in this type of till have very low concentrations of chloride and sulfate ion and are generally hard to very hard.

3.3.1 Ion Exchange

The ion exchange capacity of a soil or rock is generally attributed to its clay mineral content, although silicate minerals do provide a minor contribution. When leachate moves through soil, ion exchange or sorption will occur, but because the strength of the force holding the sorbed ions is a function of charge density of the ion, each ion type sorbs to a differing degree.

The ion exchange distribution coefficient K_d is a measure of the sorption that takes place between a soil and a particular ion. These parameters have been measured for the reactions between selected heavy metals and experimental clay-sand mixtures (11, 12). These studies indicated that cationic heavy metals are generally adsorbed to a greater degree than the anionic forms of heavy metals depending on the pH of the solution (anionic forms show less sorbtion in alkaline solutions).

In the Valparaiso and Tinley tills, the predominant cation calcium will exchange with most other cations, particularly the heavy metals. Calcium and magnesium (the second most predominant cation) have about the lowest affinity for ion adsorption and, therefore, are easily replaced by other cations in solution.

The free calcium and magnesium released by this type of reaction will combine in an alkaline solution with the bicarbonate anion to form a precipitate which will further reduce the premeability of the till liner system. If acids are present as leachate in the landfill the excess calcium and magnesium ions will combine with the anionic portion of acids forming a precipitate to further reduce clay permeability and at the same time neutralize the acid.

The relationship between the rate of travel of leachate and the rate of advance of the ion front in the till liner is determined by the retardation coefficient. This parameter is related to the ion exchange distribution coefficient K_d by the following equation:

$$K_f = 1 + \rho/\phi\ K_d \qquad \text{(Reference 13)}$$

Where ρ is the bulk density, ϕ the effective porosity of the soil, and K_f is the retardation factor. The retardation factor is soil-ion dependent as is the ion exchange distribution coefficient.

The overall ion exchange capacity and adsorption potential are good for the clay tills at the Interlake site. Ion exchange activity will release calcium and magnesium, which will form precipitates with solute anions over the full range of the pH scale. The low porosity of the clay tills will also contribute to the ion retention by increasing the retardation factor K_f.

3.3.2 Ion Filtration

Ion filtration is the retention of both cations and anions by the positively charged electrostatic field created in the pore space of a compact clay. As leachate moves through the pore spaces, anions are attracted to the positive charged surfaces of the clay and cations are repulsed; but because electrical neutrality must be maintained, neither cations nor anions move readily through the electrostatic field. The degree of retention by ion filtration is a function of exchange capacity of the soil, charge density of the individual species, temperature, concentrations in solution, and compaction pressure (14).

Ion filtration differs from ion exchange in that both anions and cations are retained, whereas ion exchange anions are not effected. The dense packing of well graded particles characteristic of the tills at the Interlake site will contribute to the ion filtration mechanism and assist in retention of typical landfill anions, such as chlorine, ammonia, and nitrate.

3.3.3 Solubility

Solubility reactions that provide geochemical control are hydrolysis and precipitation of insoluble oxides and hydroxides, oxidation-reduction reactions that produce insoluble products and precipitation of insoluble compounds from reactions with ground water constituents. The contribution of the first two types of solubility reactions can be assessed using Eh-pH diagrams constructed from thermodynamic data.

Cationic heavy metals form precipitates with carbonate or hydroxyls when pH rises above 6.0 (11, 12). The insoluble precipitates are then immobilized until a decrease in pH redissolves the precipitate or higher affinity cations replace the heavy metals re-releasing them into solution again.

The alkaline Interlake site tills will hold the cationic heavy metals by precipitating heavy metal carbonates. This geochemical control may be important as long as the slightly akaline nature of the landfill and its leachate can be maintained.

3.3.4 Soil Dispersivity

Dispersivity is a soil characteristic exhibited by some types of clay. When these clays are placed in contact with water, the repulsive electrical forces exceed the attracting Van Der Waals forces which hold the clay

structure together. The result is a dispersed clay structure with a much higher permeability. The main property of a clay governing the susceptibility to dispersion is the sodium cation content.

The potential for dispersion in the Interlake tills can be assessed by comparing exchangeable sodium percentage (ESP) to lower bound limits proposed by Sherard (15). ESP is the ratio of sodium in the exchange complex to the cation exchange capacity expressed as a percentage. Using the results presented in Appendix D, the ESP values for Interlake tills are in the range of about 2 to 4.5. This is below Sherard's moderately dispersive range of 7 to 10 and well below the serious dispersion potential limit of 15 or more.

The high kaolinite content of the Interlake tills produces a low exchangeable sodium percentage. The tills are non-dispersive and will maintain their impermeable nature when subjected to ionic solutions of inorganic substances.

3.4 Water Control

3.4.1 Ground Water Control

Two ground water systems are present within the depths investigated during this study; the shallow ground water in the recent surface alluvium overlying the glacial tills and the deeper ground water in the dolomite bedrock which is confined by the glacial tills.

The shallow ground water flows southwesterly across the site at a very slow to near stagnant rate and receives recharge from the surface swampland ponds. The ultimate discharge point for this water is Lake Calumet. The

surrounding area is relatively flat and the Calumet River is nearby. Accordingly, significant flow from the north and east across the site to Lake Calumet is not anticipated. However, the sands and slag fill are porous and will drain quickly into open excavations. For this reason ground water control will be necessary. Ditches, pumping, cut-off methods, or other conventional techniques will be effective.

The deeper dolomite aquifer is presently below drinking water standards. Its yield is low and sporadic. This aquifer will be isolated from the landfill by a 20 to 30 foot-thick layer of undisturbed till between the bottom of the landfill and the aquifer. Factors controlling this thickness are not only ground water quality protection, but prevention of bottom heave in open cells during construction. The weight of this clay must counteract the excess head (average of 60 feet) in the confined bedrock aquifer. By taking these precautions against bottom heave in the excavation, the bedrock aquifer should remain essentially unaffected by a properly designed and operated landfill.

The proposed landfill cells will penetrate through porous seams, thought to be lenses of limited extent. These lenses will likely drain quickly and then can be sealed off. Should seams with good connections to the shallow ground water or rock aquifer be encountered, dewatering, grouting, or a deep cut-off structure may be needed.

The on-site well should be sealed prior to landfill development to preclude its becoming a conduit for contaminants to the rock aquifer. The actual sealing procedure is dependent on the specific well construction which is unknown at this time. However, the sealing technique should seal the interior of the pipe and any annular space which may remain between the pipe and original drill hole. One method would be to grout the pipe to the rock surface with a non-shrink grout. Then over drill the pipe to the rock

surface, remove the pipe, and grout the hole shut. All grouting below the water table should be pumped from the bottom up.

3.4.2 Flood Water Control

The Corps of Engineers has not determined the 100-year flood elevation for the Lake Calumet area (16). However, the actual flood levels have been recorded since 1900 (17). The highest recorded level at Lake Calumet was slightly less than elevation 583 in 1954. The water level can be controlled by the O'Brien Lock and Dam; the entire site perimeter and two-thirds of the site is currently near elevation 587; and the existing drainage lines have back flow preventers already installed. Therefore, the site is currently relatively secure from flooding and further "flood proofing" measures do not appear warranted.

4.0 CONCLUSIONS - SITE SUITABILITY

Based on the data developed in the course of our field exploration, testing and analysis, the Interlake Site is suitable for landfill development. Principal considerations include the following:

1. The majority of the soils at the site are relatively impermeable and geochemically suitable for use as liner material for most of the typical landfill leachates. The surrounding ground water is not used for potable purposes in nearby areas allowing for extensive attenuation and dilution in the event of leakage.

2. The sand and silt seams do not appear to be continuous, but rather saturated lenses. Accordingly, the control of ground water flow into the excavation is not expected to require deep cut-offs, grouting, or dewatering.

3. Although the soils exhibit low permeabilities, they are only moderately plastic, facilitating excavation and recompaction.

4. Normal landfill operations will likely result in a lower phreatic surface inside the cell than outside. Thus, an inward gradient will act across the liner. As long as such conditions prevail, the leachate can only diffuse outward, a process measured in geological time (13).

Several precautions are recommended. If sand or silt seams are encountered during cell excavation, they should be over-excavated and backfilled with liner material. If it cannot be shown that the Valparaiso till does not contain fractures, they should be assumed to exist. This can be accommodated by a recompacted soil liner or synthetic liner system. The specific liner design should address the leachate composition and expected hydraulic gradients.

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APPENDIX A

FIELD OPERATIONS AND BORING LOGS

- Discussion of Field Operations
- Boring Log Legend
- Boring Logs
    - SS-Series
    - ST-Series
    - B-Series

FIELD OPERATIONS

The general field procedures employed by Canonie Environmental are summarized in ASTM Specification D-420 which is entitled "Investigating and Sampling Soils and Rocks for Engineering Purposes." This recommended practice lists recognized methods for determining soil and rock distribution and ground water conditions. These methods include geophysical and in situ methods as well as borings.

Soil Drilling Methods

Borings are drilled to obtain subsurface samples using one of several alternative techniques depending upon the subsurface conditions and purpose of the boring. At the Interlake site, we used two drilling procedures.

The soil test borings were advanced using rotary drilling methods which consist of mechanically twisting a carbide cutting bit into the soil. Fluid is pumped through the cutting bit as it turns. The fluid acts as a lubricant, stabilizes the borehole (prevents cave-in), and carries the soil cuttings to the surface, where the fluid is recirculated. This fluid may be water or drilling "mud". Only "potable" water from a nearby hydrant was used on this project. Drilling mud is a combination of water and a thickening agent and is used when water alone will not stabilize the borehole. This drilling process is called "Wash Drilling" or "Rotary Drilling with fluid" and is especially efficient when drilling hard soil, soft rock, or other abrasive type materials which make auger-drilling difficult. Penetration testing (discussed below) was conducted at five-foot intervals.

Auger borings were advanced by mechanically twisting a steel or carbide tipped six-inch O.D. auger into the soil. No regular soil sampling was conducted. These borings were drilled primarily for the installation of piezometers.

These drilling methods are not capable of penetrating through material designated as "soil test boring refusal." Refusal, thus indicated, may result from hard cemented soil, soft weathered rock, coarse gravel or boulders, thin rock seams, or the upper surface of sound continuous rock. Core drilling procedures were used to determine the character and continuity of refusal materials and are discussed below.

Upon completion of all borings, either a piezometer was grouted in or the boring was grouted shut. The grout consists of a cement bentonite mix and is pumped into the boring through drill rods. The boring is grouted from the bottom up, displacing any fluid in the hole.

Soil Sampling Methods

The drilling operations do not normally provide adequate information on the type, strength, and compressibility of the subsurface soils. Therefore, standard penetration tests and split barrel sampling are normally conducted in the borings.

The standard penetration test and split barrel sampling are conducted simultaneously according to ASTM Specification D-1586. At regular intervals, the drilling tools are removed and soil samples are obtained with a standard split tube sampler connected to an AW or N rod. The sampler is first seated six inches, to penetrate any loose cuttings, then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler each six-inch interval is recorded. The number of blows to drive the sampler the final foot is designated the "penetration resistance." Representative portions of the soil samples obtained from each split barrel sample are placed in glass jars, sealed, and transported to our laboratory.

Descriptions of the split barrel samples and the penetration resistances are shown on the "Test Boring Records."

Split tube samples are suitable for visual examination and classification tests, but are not sufficiently intact for quantitative laboratory testing. For quantitative testing, relatively undisturbed samples are obtained by pushing sections of three-, five-, or six-inch O.D., 16 guage, steel or brass tubing (Shelby tube) into the soil at the desired sampling levels. This procedure is described by ASTM Specification D-1587. Each tube, together with the encased soil, is carefully removed from the ground, made airtight, and transported to the laboratory. Locations and depths of undisturbed samples are shown on the "Test Boring Record."

Rock Coring and Sampling Procedure

If required, casing is set in the drilled hole through the overburden soils to keep the hole from caving. Refusal materials were then cored according to ASTM Specification D-2113 using a diamond-studded bit fastened to the end of a hollow double-tube core barrel. This device was rotated at high speeds and the cuttings were brought to the surface by circulating water. Core samples of the material penetrated were protected and retained in the swivel-mounted inner tube. Upon completion of each drill run, the core barrel was brought to the surface and the samples removed and placed in boxes. The samples were returned to our laboratory where the rock was identified and the recovery was determined by an engineer or geologist.

The recovery is the ratio of the sample length obtained to the depth drilled, expressed as a percent. The percent recovery is related to rock soundness and continuity. Rock descriptions, recoveries, and the bit size used are shown on the Test Boring Records. The AX, BX, and NX sizes designate a bit which obtains rock cores 1-1/8, 1-5/8, and 2-1/8.

Rock Quality Designation (RQD) is the ratio of the sample length obtained, excluding any pieces under four inches in length, to the depth drilled and is expressed as a percent. When properly interpreted, the RQD is an empirical guide to the quality of rock as related to bearing pressure considerations.

Description	Excellent	Good	Fair	Poor	Very Poor
RQD	100-90	90-75	75-50	50-25	25-0

Boring Log Preparation

The subsurface conditions encountered during drilling are reported on a field test boring record by the chief driller. The record contains information concerning the boring method, samples attempted and recovered, indications of the presence of various materials such as coarse gravel, cobbles, etc., and observations between samples. Therefore, these boring records contain both factual and interpretive information. The field boring records are on file in our office.

The soil samples plus the field boring records are reviewed by an engineer or geologist. The engineer classifies the soils in general accordance with the procedures outlined in ASTM Specification D-2488 and prepares the final boring records which are the basis for our evaluations and recommendations.

The final boring records represent our interpretation of the contents of the field records based on the results of the engineering examinations and tests of the field samples. These records depict subsurface conditions at the specific locations and at the particular time when drilled. Soil conditions at other locations may differ from conditions occurring at these boring locations. Also, the passage of time may result in a change in the subsurface soil and ground water conditions at these boring locations. The lines designating the interface between soil or refusal materials on the records and on profiles represent approximate boundaries. The transition between materials may be gradual. The final boring records are included with this report.

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Boring Log Legend

SAMPLE

No: (Number) Soil samples are numbered consecutively from the ground surface. Core samples are numbered consecutively from the first core run.

Type: SS= Split-Spoon (2" O.D.) ST= Shelby Tube A= Auger Cuttings
PT= Piston Tube CR= Core Run

Interval: The depth of sampling interval in feet below ground surface.

BLOW COUNT

The number of blows required to drive a 2-inch O.D. split-spoon sampler with a 140 pound hammer falling 30-inches. When appropriate, the sampler is driven 18 inches and blow counts are reported for each 6-inch interval. The sum of blow counts for the last two 6-inch intervals is designated as the standard penetration resistance (N) expressed as blows per foot.

RECOVERY IN INCHES

The length of sample recovered by the sampling device.

U.S.C.S SOIL TYPE

The Unified Soil Classification System symbol for recovered soil samples determined by visual examination or laboratory tests. Refer to ASTM D2487-69 for a detailed description of procedure and symbols. Underlined symbols denote classifications based on laboratory tests (ie: ML), all others are based on visual classification only.

PERCENT MOISTURE

Natural moisture content of sample expressed as percent of dry weight.

qu,TSF

Unconfined compressive strength in tons per square foot obtained by Hand Penetrometer. Laboratory compression test values are indicated by underlining.

CONTACT DEPTH

The contact depth between soil layers is interpreted from significant changes in recovered samples and observations during drilling. Actual changes between soil layers often occur gradationally and the contact depths shown on the boring logs should be considered as approximate.

SOIL DESCRIPTION AND REMARKS

Soil descriptions include consistency or density, color, predominant soil types, and modifying constituents.

COHESIVE SOILS			GRANULAR SOILS	
Consistency	qu (TSF)	Blows/Ft.	Density	Blows Per Foot
Very Soft	less than 0.25	0-1	Very Loose	4 or less
Soft	0.25 to 0.50	2-4	Loose	5 to 10
Medium Stiff	0.50 to 1.00	5-8	Medium Dense	11 to 30
Stiff	1.00 to 2.00	9-15	Dense	31 to 50
Very Stiff	2.00 to 4.00	15-30	Very Dense	over 50
Hard	more than 4.00	Over 30		

PARTICLE SIZE DESCRIPTION

Boulder=	Larger than 12 inches.
Cobble=	3 to 12 inches.
Gravel=	0.187 to 3 inches.
Sand=	0.074 mm to 4.76 mm.
Silt and Clay=	Smaller than 0.074 mm

DEFINITION OF TERMS

Trace=	5 to 12 percent by weight.
Some=	12 to 30 percent by weight.
And=	Approximately equal fractions.
( )=	Drillers observation.

PIEZO.

(Piezometer) Screened interval of the piezometer installation is denoted by cross-hatching.

GENERAL NOTE

The boring logs and related information depict subsurface conditions only at the specific locations and dates indicated. Soil conditions and water levels at other locations may differ from conditions occurring at these boring locations. Also the passage of time may result in a change in the conditions at these boring locations.

SOIL TEST BORING REFUSAL

Defined as any material causing a blow count greater than 100 blows/6 inches. Such material may include bedrock, "floating" rock slabs, boulders, dense gravel seams, or cemented soils. Refusal is usually indicated in fractional notation showing number of blows as the numerator and inches of penetration as the denominator.

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Boring Log

PROJECT No. 81-099
BORING No. SS-1
PAGE 1 OF 1

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 1724.0 N. AND 3152.0 E. OF THE SW CORNER SURFACE ELEV. 587.3
DRILLER CANONIE DRILLING, WILLIE HOLLOMAN DATE: START 4-20-82 FINISH 4-27-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 TO 6	BLOW COUNT 6 TO 12	BLOW COUNT 12 TO 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
100												101.0	RUN #1 101.0 TO 103.5 FT. RECOVERED 2.5 FT., 100 PERCENT.	
													RUN #2 103.5 TO 110.0 FT. RECOVERED 7.5 FT., 100 PERCENT	
105													MEDIUM HARD, MODERATELY WEATHERED, FOSSILIFEROUS, VUGGY LIGHT TO MEDIUM GRAY DOLOMITE WITH SHALE PARTINGS AND PYRITE INFILLINGS.	
110												110.0	RQD - 68 PERCENT.	

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Boring Log

PROJECT No. 81-099
BORING No. SS-2
PAGE 1 OF 1

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 1336.0 N. AND 39.0 E. OF THE SW CORNER SURFACE ELEV. 583.3
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 4-28-82 FINISH 5-3-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 to 6	BLOW COUNT 6 to 12	BLOW COUNT 12 to 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
75													RUN #1 76.5 TO 85.0 FT. RECOVERED 8.4 FT., 99 PERCENT.	
												76.5	MEDIUM HARD, FRESH, MASSIVE, FINE GRAINED MEDIUM GRAY DOLOMITE FROM 76.5 TO 79.3 FT.	
80												79.3		
									ML				GRAY CLAYEY SILT, TRACE OF COARSE SAND, WEATHERED BEDROCK AND FINE GRAVEL FROM 79.3 FT. TO 82.0 FT.	
85												82.0	MEDIUM HARD, SLIGHTLY WEATHERED, MASSIVE MEDIUM GRAY DOLOMITE FROM 82.0 TO 84.9 FT.	
90														
35													RUN #2 85.0 TO 88.0 FT. RECOVERED 2.45 FT., 82 PERCENT.	
100													RUN #3 88 TO 101 FT. RECOVERED 9.6 FT. 74 PERCENT.	
												101.0	MEDIUM HARD, FRESH, FOSSILIFEROUS FINE GRAINED, LIGHT TO MEDIUM GRAY DOLOMITE WITH PYRITE INFILLINGS. RQD - 70 PERCENT.	
105														

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Boring Log

PROJECT No. 81-099
BORING No. ST-1
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 192.0 N. AND 2971.0 E. OF THE SW CORNER SURFACE ELEV. 587.3
DRILLER CANONIE TEST BORING, JIM WANDERSEE DATE: START 2-24-82 FINISH 3-3-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
5	1	SS	3.5	5.0	30	24	6	12	-	43.7		5.5	SLAG, FINE SAND (FILL MATERIAL).	
10	2	SS	8.5	10.0	4	5	8	18	SP-SM	28.0		12.0	MEDIUM DENSE BROWN FINE SAND, TRACE OF SILT.	
15	3	SS	13.5	15.0	4	5	8	18	CL	22.8				
20	4	SS	18.5	20.0	4	7	8	18	CL	19.8				
25	5	SS	23.5	25.0	7	9	15	18	CL	20.2			STIFF TO HARD GRAY SILTY CLAY, TRACE OF COARSE TO FINE SAND.	
30	6	SS	28.5	30.0	8	14	19	18	CL	19.2				
35	7	ST	33.5	35.5	-	-	-	-	CL	-		37.0		
40	8	SS	38.5	40.0	15	18	19	18	ML	12.6				

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Boring Log

PROJECT No. 81-099
BORING No. ST-1
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 192.0 N. AND 2971.0 E. OF THE SW CORNER SURFACE ELEV. 587.3
DRILLER CANONIE TEST BORING, JIM WANDERSEE DATE: START 2-24-82 FINISH 3-3-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
45	9	SS	43.5	45.0	10	13	17	18	ML	13.2				
50	10	SS	48.5	50.0	16	21	48	18	ML	12.5				
55	11	SS	53.5	55.0	25	34	26	18	ML	11.7			HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND.	
60	12	SS	58.5	60.0	12	18	24	18	ML	14.2				
65	13	SS	63.5	65.0	10	14	24	18	ML	15.7				
												67.0		
70	14	SS	68.5	70.0	9	10	13	18	CL	25.4			VERY STIFF TO HARD GRAY CLAY, TRACE OF SILT, TRACE OF COARSE SAND, (SAND SEAM AT 71 FT.).	
75	15	SS	73.5	75.0	15	21	24	18	CL	13.7				
												77.0		
80	16	SS	78.5	80.0	24	31	51	18	ML-CL	18.1			HARD GRAY SILTY CLAY, SILT SEAMS, TRACE TO SOME FINE SAND.	

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Boring Log

PROJECT No. 81-099
BORING No. ST-1
PAGE 3 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 192.0 N. AND 2971.0 E. OF THE SW CORNER SURFACE ELEV. 587.3
DRILLER CANONIE TEST BORING, JIM WANDERSEE DATE: START 2-24-82 FINISH 3-3-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6 (6)	BLOW COUNT 6 12 (12)	BLOW COUNT 12 18 (18)	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
85	17	SS	83.5	85.0	21	37	24	18	CL	17.0			SAME AS ABOVE.	
												87.0		
90	18	SS	88.5	90.0	36	43	42	18	ML	14.7			HARD GRAY CLAYEY SILT, TRACE OF DOLOMITE ROCK FRAGMENTS.	
95	19	SS	93.5	95.0	23	34	100/5	18	ML	13.8				
100	20	SS	98.5	100.0	30	43	39	18	ML	12.1				
												101.1	CORED FROM 101.6 FT. TO 116.0 FT. RECOVERED 16.4 FT., 98 PERCENT.	
105													HARD, MODERATELY TO HIGHLY WEATHERED, FOSSILIFEROUS, VUGGY, FINE GRAINED MEDIUM GRAY DOLOMITE, WITH PYRITE INFILLINGS. RQD - 70 PERCENT.	
110														
115														
												116.0		

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Boring Log

PROJECT No. 81-099
BORING No. ST-2
PAGE 1 OF 2

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3488.0 N. AND 3208.0 E. OF THE SW CORNER SURFACE ELEV. 584.5
DRILLER CANONIE TEST BORING, JIM WANDERSEE DATE: START 3-4-82 FINISH 3-8-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
5	1	SS	3.5	5.0	4	5	5	18	SM	28.7			MEDIUM DENSE BROWN FINE SAND, TRACE OF SILT.	
10	2	SS	8.5	10.0	4	5		18	SM	28.2		13.0		
15	3	SS	13.5	15.0	4	7	13	18	ML	17.7		18.0	VERY STIFF DARK GRAY CLAYEY SILT, TRACE TO SOME FINE TO COARSE SAND.	
20	4	SS	18.5	20.0	3	5	8	18	CL	20.8			MEDIUM STIFF GRAY CLAY, TRACE OF SILT, TRACE OF COARSE SAND, TRACE OF COARSE GRAVEL, TRACE TO SOME FINE SAND.	
25	5	ST	23.5	25.0	-	-	-	-	-	-		27.0		
30	6	SS	28.5	30.0	13	19	21	18	ML	15.2			HARD DARK GRAY CLAYEY SILT, TRACE OF FINE TO MEDIUM SAND.	
35	7	SS	33.5	35.0	26	40	55	18	ML	12.8				
40	8	SS	38.5	40.0	16	44	100/2	12	ML	11.6		41.0		

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Boring Log

PROJECT No. 81-099
BORING No. ST-2
PAGE 2 OF 2

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3488.0 N. AND 3208.0 E. OF THE SW CORNER SURFACE ELEV. 584.8
DRILLER CANONIE TEST BORING, JIM WANDERSEE DATE: START 3-4-82 FINISH 3-8-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 to 6	BLOW COUNT 6 to 12	BLOW COUNT 12 to 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
												41.0	CORED FROM 41.0 FT. TO 60.8 FT. RECOVERED 18.4 FT., 93 PERCENT. HARD, MODERATELY TO HIGHLY WEATHERED, FOSSILIFEROUS, VUGGY, FINE GRAINED MEDIUM GRAY DOLOMITE, WITH PYRITE INFILLINGS. RQD - 49 PERCENT.	
45														
50														
55														
60												60.8		

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Boring Log

PROJECT No. 81-099
BORING No. ST-3
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3877 N. AND 111.0 E. OF THE SW CORNER SURFACE ELEV. 586.3
DRILLER CANONIE TEST BORING, WILLIAM HOLLOMAN DATE: START 4-7-82 FINISH 4-10-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
												3.0	FILL MATERIAL.	
5	1	SS	3.5	5.0	3	4	6	18	CL			7.0	STIFF GRAY SILTY CLAY, TRACE OF COARSE SAND, TRACE OF ORGANIC MATERIAL.	
10	2	SS	8.5	10.0	2	3	5	12	ML			10.5	FIRM GRAY SANDY SILT, TRACE TO SOME ORGANIC MATERIAL.	
15	3	SS	13.5	15.0	3	5	7	12	CL				STIFF GRAY SANDY CLAY, TRACE OF FINE TO COARSE SAND, TRACE OF SILT, TRACE OF PYRITE.	
20	4	SS	18.5	20.0	4	7	9	18	CL			22.0		
25	5	SS	23.5	25.0	7	13	17	18	ML					
30	6	SS	28.5	30.0	9	9	12	18	ML				VERY STIFF TO HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND.	
35	7	SS	33.5	35.0	7	12	18	18	ML					
40	8	SS	38.5	40.0	10	14	20	18	ML					

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Boring Log

PROJECT No. 81-099
BORING No. ST-3
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3877 N. AND 111.0 E. OF THE SW CORNER SURFACE ELEV. 586.3
DRILLER CANONIE TEST BORING, WILLIAM HOLLOMAN DATE: START 4-7-82 FINISH 4-10-82

DEPTH	SAMPLE No.	SAMPLE TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
45	9	SS	43.5	45.0	13	15	27	18	ML					
50	10	SS	48.5	50.0	17	19	27	18	ML				HARD GRAY CLAYEY SILT, TRACE TO SOME FINE TO COARSE SAND, TRACE FINE GRAVEL.	
55	11	SS	53.5	55.0	9	16	18	18	ML-CL			57.0		
60	12	SS	58.5	60.0	8	14	24	18	CL				VERY STIFF TO HARD GRAY SILTY CLAY, TRACE OF COARSE SAND.	
65	13	SS	63.5	65.0	7	11	15	18	CL			67.0		
70	14	SS	68.5	70.0	18	26	43	18	ML				HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND.	
75	15	SS	73.5	75.0	34	30	49	18	ML					
80	16	SS	78.5	80.0	30	39	36	18	ML					

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Boring Log

PROJECT No. 81-099
BORING No. ST-3
PAGE 3 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3877 N. AND 111.0 E. OF THE SW CORNER SURFACE ELEV. 586.2
DRILLER CANONIE TEST BORING, WILLIAM HOLLOMAN DATE: START 4-7-82 FINISH 4-10-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 TO 6	BLOW COUNT 6 TO 12	BLOW COUNT 12 TO 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
85	17	SS	83.5	85.0	30	67	92	18	ML				HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND.	
												86.5	CORED 86.5 FT. TO 101.5 FT. RECOVERED 10 FT., 100 PERCENT.	
90													MEDIUM, SLIGHTLY WEATHERED FINE GRAINED, MASSIVE, LIGHT TO MEDIUM GRAY DOLOMITE, WITH PYRITE INFILLING IN FRACTURES. ROD - 98 PERCENT	
95														
100												101.5		

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Boring Log

PROJECT No. 81-099
BORING No. ST-4
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 86.0 N. AND 195.0 E. OF THE SW CORNER SURFACE ELEV. 590.0
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-8-82 FINISH 3-12-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0-6	BLOW COUNT 6-12	BLOW COUNT 12-18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
5	1	SS	3.5	5.0	4	4	10	1	-	-			SLAG, SAND, BRICK (FILL MATERIAL).	
10	2	SS	8.5	10.0	5	4	6	3	-	19.2		12.0		
										32.1			DENSE GRAY CLAYEY SAND.	
15	3	SS	13.5	15.0	8	15	23	18	SP	23.2		14.5		
20	4	SS	18.5	20.0	16	12	15	15	CL	19.3			HARD GRAY CLAY, TRACE OF SILT, TRACE OF COARSE SAND.	
25	5	SS	23.5	25.0	6	9	14	18	CL	21.4				
30	6	SS	28.5	30.0	9	18	25	18	CL	21.6		32.0		
35	7	SS	33.5	35.0	40	70	100/3	14	ML	19.1			HARD GRAY SILT, TRACE OF CLAY.	
40	8	SS	38.5	40.0	25	42	72	-	ML	13.3		42.0		

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Boring Log

PROJECT No. 81-099
BORING No. ST-4
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 86.0 N. AND 195.0 E. OF THE SW CORNER SURFACE ELEV. 590.0
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-8-82 FINISH 3-12-82

DEPTH	SAMPLE No.	SAMPLE TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0-6	BLOW COUNT 6-12	BLOW COUNT 12-18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
												42.0		
45	9	SS	43.5	45.0	38	81		8	ML	14.1				
50	10	SS	48.5	50.0	36	55	73	7	ML	13.8				
55	11	SS	53.5	55.0	69	100	-	7	ML	17.5			HARD DARK GRAY TO GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE OF FINE GRAVEL, FINE TO COARSE SAND SEAMS.	
60	12	SS	58.5	60.0	59	65	82	-	ML	19.7				
65	13	ST	63.5	65.0	-	-	-	-	ML-CL	-				
										15.3		68.5	HARD GRAY CLAY, TRACE OF SILT.	
70	14	SS	68.5	70	16	48	88	18	ML	24.1		69.4	TRACE OF FINE SAND.	
75	15	SS	73.5	75.0	69	100/3	-	7	ML	13.2			HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND.	
												79.0		
80	16	SS	78.5	80.0	100/2	-	-	-	GC	-				

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Boring Log

PROJECT No. 81-099
BORING No. ST-4
PAGE 3 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 86.0 N. AND 195.0 E. OF THE SW CORNER SURFACE ELEV. 590.0
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-8-82 FINISH 3-12-82

DEPTH	SAMPLE No.	SAMPLE TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0-6	BLOW COUNT 6-12	BLOW COUNT 12-18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
80	17	SS	80.0	82.5	18	7	1/6	6	GC	-				
													LOOSE TO VERY DENSE COARSE SAND AND GRAVEL, CLAY BOULDERS, WEATHERED ROCK FRAGMENTS.	
85	18	SS	83.5	85.0	40	45	35	3	GC	-				
	19	SS	85.5	87.0	100/4	-	-	-	-	8.9				
												88.0		
90													CORED 88.5 FT TO 103.5 FT. RECOVERED 14.6 FT., 98 PERCENT.	
													HARD, FRESH TO SLIGHTLY WEATHERED, MASSIVE, FINE GRAINED MEDIUM DARK GRAY DOLOMITE, SLIGHTLY FOSSILIFEROUS, PYRITE INFILLING IN FRACTURES.	
95													ROD - 83 PERCENT.	
100														
												103.8		
105														

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Boring Log

PROJECT No. 81-099
BORING No. R-1
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 986.0 N. AND 3162.0 E. OF THE SW CORNER SURFACE ELEV. 588.8
DRILLER CANONIE TEST BORING, JERRY HAMMAN DATE: START 3-15-82 FINISH 3-16-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
5	1	SS	3.5	5.0	10	2	2	3	-	12.4		5.0	SLAG, GRAVEL, AND CLAY, (FILL MATERIAL).	
10	2	SS	8.5	10.0	3	9	13	18	SM	26.8		13.0	MEDIUM DENSE BROWN SILTY FINE SAND.	
15	3	SS	15.0	16.5	2	4	5	12	CL	23.7				
20	4	SS	20.0	21.5	5	6	8	18	CL	21.2			STIFF TO VERY STIFF GRAY SILTY CLAY, TRACE OF FINE TO COARSE SAND.	
25	5	SS	25.0	26.5	4	7	8	18	CL	23.2				
30	6	SS	30.0	31.5	5	8	8	18	CL	23.4				
35	7	SS	35.0	36.5	9	13	15	10	CL	23.8				
40	8	SS	40.0	41.5	15	24	26	16	ML	13.4		38.5		

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Boring Log

PROJECT No. 81-099
BORING No. R-1
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 986.0 N. AND 3162.0 E. OF THE SW CORNER SURFACE ELEV. 588.8
DRILLER CANONIE TEST BORING, JERRY HAMMAN DATE: START 3-15-82 FINISH 3-16-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
45	9	SS	45.0	46.5	14	26	38	18	ML	12.1			HARD DARK GRAY CLAYEY SILT AND FINE TO COARSE SAND.	
50	10	SS	50.0	51.5	19	33	40	16	ML	13.8				
												53.5		
55	11	SS	55.0	56.5	21	29	37	18	ML	16.9				
60	12	SS	60.0	61.5	15	16	30	18	ML	15.9				
65	13	SS	65.0	66.5	6	7	7	7	ML-CL	19.8			STIFF TO HARD DARK GRAY SILTY CLAY, TRACE OF FINE TO COARSE SAND, TRACE OF FINE GRAVEL.	
70	14	SS	70.0	71.5	7	17	26	18	ML	14.1				
75	15	SS	75.0	76.5	10	17	27	14	ML	13.8				
												78.5		
80	16	SS	80.0	81.5	25	50	72	18	ML	12.5				

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Boring Log

PROJECT No. 81-099
BORING No. R-1
PAGE 3 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 986.0 N. AND 3162.0 E. OF THE SW CORNER SURFACE ELEV. 588.8
DRILLER CANONIE TEST BORING, JERRY HAMMAN DATE: START 3-15-82 FINISH 3-16-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6 6	BLOW COUNT 6 12 12	BLOW COUNT 12 18 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
85	17	SS	85.0	86.5	39	50	76	18	ML	11.7			HARD DARK GRAY CLAYEY SILT, TRACE OF COARSE SAND. LAYER OF SILTY CLAY AT 90 FT.	
90	18	SS	90.0	91.5	22	32	48	18	ML-CL	14.7				
95	19	SS	95.0	96.5	22	40	45	18	ML	11.6				
100	20	SS	100.0	101.2	30	49	100/3	12	ML	13.4				
													COBBLES AND WEATHERED ROCK FRAGMENTS.	
105	21	SS	101.2	104.5	-	-	-	-	-	-		104.5	SOIL TEST BORING REFUSAL AT 104.5 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. B-2
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 1632.0 N. AND 3121.0 E. OF THE SW CORNER SURFACE ELEV. 586.6
DRILLER CANONIE TEST BORING, JERRY HAMMAN DATE: START 3-16-82 FINISH 3-17-82

DEPTH	SAMPLE No.	SAMPLE TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
5	1	SS	3.5	5.0	4	5	2	12	-	20.9			LOOSE SAND, GRAVEL, SLAG AND RED CLAY (MIXED FILL).	
10	2	SS	8.5	10.0	12	20	16	10	-	16.1		12.0		
15	3	SS	15.0	16.5	4	7	11	12	CL	21.2			VERY STIFF GRAY SILTY CLAY, TRACE OF COARSE SAND.	
20	4	SS	20.0	21.5	11	20	29	14	ML	23.0		18.5	HARD GRAY CLAYEY SILT, TRACE OF FINE TO COARSE SAND.	
25	5	SS	25.0	26.5	4	8	11	16	ML-CL	20.4		23.5	VERY STIFF GRAY SILTY CLAY, TRACE OF COARSE SAND.	
30	6	SS	30.0	31.5	4	7	10	14	ML-CL	23.7				
35	7	SS	35.0	36.5	21	41	38	18	ML	14.6		33.5	HARD GRAY CLAYEY SILT, SOME COARSE SAND, TRACE OF FINE SAND.	
40	8	SS	40.0	41.5	11	23	32	18	ML	13.2				

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Boring Log

PROJECT No. 81-099
BORING No. B-2
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 1632.0 N. AND 3121.0 E. OF THE SW CORNER SURFACE ELEV. 586.6
DRILLER CANONIE TEST BORING, JERRY HAMMAN DATE: START 3-16-82 FINISH 3-17-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 TO 6	BLOW COUNT 6 TO 12	BLOW COUNT 12 TO 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
45	9	SS	45.0	46.5	16	28	47	18	ML	13.7				
50	10	SS	50.0	51.5	17	34	48	18	ML	16.4			HARD GRAY CLAYEY SILT, SOME COARSE SAND, TRACE OF FINE SAND.	
55	11	SS	55.0	56.5	14	22	22	18	ML	17.2				
												58.5		
60	12	SS	60.0	61.5	10	13	17	18	CL	17.6			VERY STIFF TO HARD GRAY SILTY CLAY, TRACE OF FINE TO COARSE SAND.	
65	13	SS	65.0	66.5	13	18	17	18	CL	22.1				
												68.5		
70	14	SS	70.0	71.5	23	30	26	18	ML	21.4			HARD GRAY CLAYEY SILT, SOME COARSE SAND, TRACE OF FINE SAND, SILT SEAMS.	
75	15	SS	75.0	76.5	15	28	30	18	ML	18.0				
80	16	SS	80.0	81.5	20	27	30	18	ML	12.3				

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Boring Log

PROJECT No. 81-099
BORING No. B-2
PAGE 3 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 1632.0 N. AND 3121.0 E. OF THE SW CORNER SURFACE ELEV. 586.6
DRILLER CANONIE TEST BORING, JERRY HAMMAN DATE: START 3-16-82 FINISH 3-17-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 TO 6	BLOW COUNT 6 TO 12	BLOW COUNT 12 TO 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
85	17	SS	85.0	86.5	18	22	22	18	ML	17.7			HARD GRAY CLAYEY SILT, SOME COARSE SAND, TRACE OF FINE SAND, SILT SEAMS.	
												88.5		
90	18	SS	90.0	91.5	8	15	16	18	CL	24.3			HARD GRAY SILTY CLAY.	
95	19	SS	95.0	95.8	8	100/3	-	9	CL	29.5				
												98.5	(LAYER OF CLAYEY SILT AND ROCK FRAGMENTS.)	
												99.0	SOIL TEST BORING REFUSAL AT 98.5 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. R-3
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 2226.0 N. AND 3185.0 E. OF THE SW CORNER SURFACE ELEV. 588.3
DRILLER CANONIE TEST BORING, JERRY HAMMAN DATE: START 3-17-82 FINISH 3-18-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6 / 6 12	BLOW COUNT 6 12 / 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
5	1	SS	3.5	5.0	2	1 9	9	-	16.6			CONCRETE, BRICK, SAND, AND LIMESTONE FRAGMENTS (FILL MATERIAL).	
											7.0		
10	2	SS	8.5	10.0	8	14 16	18	SM	27.9			MEDIUM DENSE GRAY SILTY SAND.	
											12.0		
15	3	SS	15.0	16.5	1	3 4	18	CL	23.7				
20	4	SS	20.0	21.5	1	3 5	18	CL	23.2			STIFF GRAY SILTY CLAY, TRACE OF COARSE SAND.	
25	5	SS	25.0	26.5	2	4 5	18	CL	33.9				
30	6	SS	30.0	31.5	3	6 8	18	CL	21.5				
											33.5		
35	7	SS	35.0	36.5	8	12 28	18	ML	14.9			HARD GRAY CLAYEY SANDY SILT, TRACE OF COARSE SAND.	
											38.5		
40	8	SS	40.0	41.5	7	10 13	18	SM	21.4			MEDIUM DENSE BLACK AND GRAY FINE TO MEDIUM SAND.	

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Boring Log

PROJECT No. 81-099
BORING No. R-3
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 2226.0 N. AND 3185.0 E. OF THE SW CORNER SURFACE ELEV. 588.3
DRILLER CANONIE TEST BORING, JERRY HAMMAN DATE: START 3-17-82 FINISH 3-18-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
												43.5	MEDIUM DENSE BLACK AND GRAY FINE TO MEDIUM SAND.	
45	9	SS	45.0	46.5	17	21	27	18	ML	13.1				
50	10	SS	50.0	51.5	21	38	53	18	ML	11.7			HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE OF FINE SAND.	
55	11	SS	55.0	56.5	19	40	55	18	ML	11.7				
60	12	SS	60.0	61.5	14	28	33	18	ML	15.8		63.5		
65	13	SS	65.0	66.5	7	10	15	18	CL	17.6			VERY STIFF GRAY SILTY CLAY, TRACE OF COARSE SAND, TRACE OF FINE GRAVEL, SOME MEDIUM TO FINE SAND.	
70	14	SS	70.0	71.5	13	17	23	18	ML	13.2		68.5		
75	15	SS	75.0	76.5	13	19	24	18	ML	13.6			HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE OF FINE SAND.	
80	16	SS	80.0	81.5	33	41	57	18	ML	12.8				

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Boring Log

PROJECT No. 81-099
BORING No. R-3
PAGE 3 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 2226.0 N. AND 2185.0 E. OF THE SW CORNER SURFACE ELEV. 588.3
DRILLER CANONIE TEST BORING, JERRY HAMMAN DATE: START 3-17-82 FINISH 3-18-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6 / 6 12	BLOW COUNT 6 12 / 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
85	17	SS	85.0	86.5	15	19 27	18	ML	20.4			HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE OF FINE SAND,	
90	18	SS	90.0	91.5	18	22 50	18	ML	11.1			(COBBLE AT 92.0 FT.)	
											94.0		
95											95.0	(ROCK FRAGMENTS.)	
												SOIL TEST BORING REFUSAL AT 94.0 FT., BORING TERMINATED.	

CanonieEngineers

Boring Log

PROJECT No. 81-099
BORING No. R-4
PAGE 1 OF 2

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 2722.0 N. AND 3215.0 E. OF THE SW CORNER SURFACE ELEV. 583.9
DRILLER CANONIE TEST BORING, HERSCHEL BOYD DATE: START 3-31-82 FINISH 4-1-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6 / 6 12	BLOW COUNT 6 12 / 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
5	1	SS	3.5	5.0	1	4 6	-	SM	-			MEDIUM DENSE BROWN FINE SAND, TRACE OF SILT, TRACE OF ORGANIC MATERIAL.	
10	2	SS	8.5	10.0	4	6 6	-	SM	-		12.0		
15	3	SS	13.5	15.0	4	7 9	-	CL	-				
20	4	SS	18.5	20.0	5	8 12	-	CL	-			STIFF TO VERY STIFF GRAY CLAY, TRACE OF COARSE TO FINE SAND.	
25	5	SS	23.5	25.0	5	6 9	-	ML	22.4				
30	6	SS	28.5	30.0	7	11 11	-	CL	-		32.0		
35	7	SS	33.5	35.0	6	20 21	-	ML	-			HARD GRAY CLAYEY SILT, TRACE OF COARSE TO MEDIUM SAND, SOME FINE SAND.	
40	8	SS	38.5	40.0	11	17 23	-	ML	-				

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Boring Log

PROJECT No. 81-099
BORING No. R-4
PAGE 2 OF 2

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 2722.0 N. AND 3215.0 E. OF THE SW CORNER SURFACE ELEV. 583.9
DRILLER CANONIE TEST BORING, HERSCHEL ROYD DATE: START 3-31-82 FINISH 4-1-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6 / 6 12	BLOW COUNT 6 12 / 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
45	9	SS	43.5	45.0	15	22 / 27	-	ML	-				
50	10	SS	48.5	50.0	24	34 / 36	-	ML	-			HARD GRAY CLAYEY SILT, TRACE OF COARSE TO MEDIUM SAND, SOME FINE SAND.	
55	11	SS	53.5	55.0	15	24 / 30	-	ML	-				
60	12	SS	58.5	60.0	15	31 / 36	-	ML	-		61.5	SOIL TEST BORING REFUSAL AT 61.5 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. R-5
PAGE 1 OF 2

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3217.0 N. AND 3219.0 E. OF THE SW CORNER SURFACE ELEV. 585.5
DRILLER CANONIE TEST BORING, HERSCHEL ROYD DATE: START 3-29-82 FINISH 3-30-82

DEPTH	SAMPLE No	SAMPLE TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0-6	BLOW COUNT 6-12	BLOW COUNT 12-18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS
5	1	SS	3.5	5.0	3	6	7	-	SM	-			MEDIUM DENSE BROWN FINE SAND, TRACE OF SILT, TRACE OF ORGANIC MATERIAL.
10	2	SS	8.5	10.0	6	6	6	-	SM	-		12.0	
15	3	SS	13.5	15.0	15	12	13	-	ML	-			GRAY CLAY, TRACE OF FINE AND COARSE SAND, TRACE OF SILT. GRAY CLAYEY SILT AT 20 FT.
20	4	SS	18.5	20.0	5	6	9	-	ML	-			
25	5	SS	23.5	25.0	6	8	12	-	ML	-		27.0	
30	6	SS	28.5	30.0	10	13	15	-	ML	-			STIFF TO HARD GRAY CLAYEY SILT, TRACE TO SOME COARSE TO FINE SAND.
35	7	SS	33.5	35.0	17	20	25	-	ML	-			
40	8	SS	38.5	40.0	27	40	47	-	ML-CL	12.1			

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Boring Log

PROJECT No. 81-099
BORING No. B-5
PAGE 2 OF 2

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3217.0 N. AND 3219.0 E. OF THE SW CORNER SURFACE ELEV. 585.5
DRILLER CANONIE TEST BORING, HERSCHEL BOYD DATE: START 3-29-82 FINISH 3-30-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
45	9	SS	43.5	45.0	30	40	47	-	ML	-				
50	10	SS	48.5	50.0	27	50	52	-	ML	-			HARD GRAY CLAYEY SILT, TRACE OF COARSE TO FINE SAND.	
55	11	SS	53.5	55.0	29	60	59	-	ML	-				
60	12	SS	58.5	59.5	76	100	-	-	ML	-		59.5	SOIL TEST BORING REFUSAL AT 59.5 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. B-6
PAGE 1 OF 1

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3953.0 N. AND 2423.0 E. OF THE SW CORNER SURFACE ELEV. 584.7
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-29-82 FINISH 3-29-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6 / 6 12	BLOW COUNT 6 12 / 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
												FILL MATERIAL	
											3.5		
5	1	SS	3.5	5.0	7	10 13	-	SM	-			MEDIUM DENSE TO VERY DENSE BROWN FINE SAND, TRACE OF SILT, TRACE OF ORGANIC MATERIAL.	
10	2	SS	8.5	10.0	19	18 13	-	SP-SM	-		11.0		
15	3	SS	13.5	15.0	15	23 25	-	CL	-			HARD GRAY SILT AND CLAY, TRACE OF COARSE TO MEDIUM SAND, TRACE OF FINE GRAVEL, SOME FINE SAND. (BOULDER AT 21.0 TO 22.0 FT.)	
20	4	SS	18.5	20.0	47	38 50	-	ML-CL	11.6				
25	5	SS	23.5	25.0	-	- -	-	-	-		28.5	CORED FROM 28.5 TO 33.5 FT. RECOVERED 3.8 FT., 76 PERCENT.	
30											33.5	HARD, MODERATELY TO HIGHLY WEATHERED, FOSSILIFEROUS, VUGGY, FINE GRAINED MEDIUM GRAY DOLOMITE. RQD - 30 PERCENT.	

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Boring Log

PROJECT No. 81-099
BORING No. B-7
PAGE 1 OF 1

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3896.0 N. AND 3192.0 E. OF THE SW CORNER SURFACE ELEV. 587.5
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 4-23-82 FINISH 4-23-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 to 6	BLOW COUNT 6 to 12	BLOW COUNT 12 to 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
5	1	SS	3.5	5.0	3	3	3	6	PT	72.1			LOOSE BLACK SANDY PEAT AT 5 FT.	
10	2	SS	8.5	10.0	23	36	37	18	SP-SM	27.7			MEDIUM DENSE TO VERY DENSE BROWN FINE SAND, TRACE OF SILT, TRACE OF COARSE SAND.	
15	3	SS	13.5	15.0	5	10	14	18	CL	22.0		17.0		
20	4	SS	19.0	20.5	7	9	15	18	ML-CL	20.9			VERY STIFF GRAY SILTY CLAY, TRACE OF COARSE SAND AND FINE GRAVEL, TRACE TO SOME MEDIUM TO FINE SAND.	
25	5	SS	23.5	24.4	23	100/5	-	10	CL	-		25.0	CORED FROM 25.5 TO 30.5 FT. RECOVERED 5.0 FT., 100 PERCENT.	
												30.5	MEDIUM, MODERATELY WEATHERED, FOSSILIFEROUS, VUGGY, FINE GRAINED MEDIUM GRAY DOLOMITE WITH PYRITE AND ASPHALTUM INFILLINGS. RQD - 79 PERCENT.	

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Boring Log

PROJECT No. 81-099
BORING No. B-8
PAGE 1 OF 2

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3912.0 N. AND 1494.0 E. OF THE SW CORNER SURFACE ELEV. 585.8
DRILLER CANONIE TEST BORING, WILLIAM HOLLOMAN DATE: START 4-14-82 FINISH 4-15-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0-6	BLOW COUNT 6-12	BLOW COUNT 12-18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
5	1	SS	3.5	5.0	3	7	18	10	-	-			FILL MATERIAL	
												6.0		
													LOOSE TO MEDIUM DENSE BROWN FINE SAND, TRACE OF SILT.	
10	2	SS	8.5	10.0	3	4	5	18	SM	26.6				
												11.0		
15	3	SS	13.5	15.0	4	5	10	18	CL	19.4			STIFF TO VERY STIFF GRAY SILTY CLAY, TRACE OF SILT, TRACE OF COARSE SAND.	
20	4	SS	18.5	20.0	4	8	12	18	CL	20.9				
												22.5		
25	5	SS	23.5	25.0	7	9	12	18	ML	12.6				
30	6	SS	28.5	30.0	6	9	11	18	ML	12.5			VERY STIFF GRAY CLAYEY SILT, TRACE OF COARSE TO MEDIUM SAND, TRACE OF FINE GRAVEL, SOME FINE SAND.	
35	7	SS	33.5	35.0	5	7	9	18	ML-CL	14.8				
40	8	SS	38.5	40.0	4	6	10	18	ML-CL	14.5				

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Boring Log

PROJECT No. 81-099
BORING No. R-8
PAGE 2 OF 2

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3912.0 N. AND 1494.0 E. OF THE SW CORNER SURFACE ELEV. 585.3
DRILLER CANONIE TEST BORING, WILLIAM HOLLOMAN DATE: START 4-14-82 FINISH 4-15-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
45	9	SS	43.5	45.0	7	12	15	18	ML	24.2			VERY STIFF GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE OF FINE SAND.	
50	10	SS	48.5	50.0	8	9	13	18	ML	15.0				
												54.0		
55	11	SS	53.5	55.0	14	22	32	18	ML	12.5			HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE OF FINE GRAVEL.	
60	12	SS	58.5	58.6	100/1	-	-	1	GW	-				
												62.7	SOIL TEST BORING REFUSAL AT 62.7 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. R-9
PAGE 1 OF 2

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3944.0 N. AND 821.0 E. OF THE SW CORNER SURFACE ELEV. 584.5
DRILLER CANONIE TEST BORING, WILLIAM HOLLOMAN DATE: START 4-12-82 FINISH 4-13-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
5	1	SS	3.5	5.0	2	1	1	0	-	34.0			FILL MATERIAL.	
												8.5	LOOSE FINE BROWN SAND.	
10	2	SS	8.5	10.0	4	5	3	18	SM-CL	24.4		9.5		
15	3	SS	13.5	15.0	4	5	7	6	CL	19.8			STIFF WET GRAY SANDY SILTY CLAY, SOME MEDIUM AND COARSE SAND.	
20	4	SS	18.5	20.0	3	4	9	18	CL	19.1		23.0		
25	5	SS	23.5	25.0	11	11	14	18	ML	14.3				
30	6	SS	28.5	30.0	8	11	14	18	ML	12.9			VERY STIFF TO HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE OF FINE GRAVEL, SOME MEDIUM TO FINE SAND.	
35	7	SS	33.5	35.0	7	10	11	18	ML	13.7				
40	8	SS	38.5	40.0	7	9	15	18	ML	12.8				

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Boring Log

PROJECT No. 81-099
BORING No. B-9
PAGE 2 OF 2

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3944.0 N. AND 821.0 E. OF THE SW CORNER SURFACE ELEV. 584.5
DRILLER CANONIE TEST BORING, WILLIAM HOLLOMAN DATE: START 4-12-82 FINISH 4-13-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 TO 6	BLOW COUNT 6 TO 12	BLOW COUNT 12 TO 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
45	9	SS	43.5	45.0	13	18	32	18	ML	13.6				
50	10	SS	48.5	50.0	15		26	18	ML-CL	14.6			VERY STIFF TO HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND, SOME MEDIUM TO FINE SAND.	
55	11	SS	53.5	55.0	14	20	32	18	ML	12.7				
60	12	SS	58.5	60.0	8	14	23	18	ML	10.2				
65	13	SS	63.5	65.0	14	21	32	18	ML	16.1				
												67.5		
70	14	SS	68.5	70.0	26	27	77	18	ML-CL	15.7			HARD WET GRAY CLAYEY SILT, SOME COARSE SAND, SOME MEDIUM GRAVEL.	
												74.0		
75	15	SS	73.5	74.0	100/5	-	-	5	ML-CL	11.8			SOIL TEST BORING REFUSAL AT 74.0 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. B-10
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3313.0 N. AND 53.0 E. OF THE SW CORNER SURFACE ELEV. 586.2
DRILLER CANONIE TEST BORING, WILLIAM HOLLOMAN DATE: START 4-1-82 FINISH 4-5-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
5	1	SS	3.5	5.0	4	5	5	18	-	19.6		7.0	SLAG, SAND (FILL MATERIAL).	
10	2	SS	8.5	10.0	7	4	3	10	SM	20.1		10.5	LOOSE GRAY SILTY SAND.	
15	3	SS	13.5	15.0	5	6	8	18	CL	18.5			STIFF TO HARD GRAY SILTY CLAY, TRACE OF COARSE SAND, TRACE OF FINE SAND.	
20	4	SS	18.5	20.0	10	15	19	18	CL	18.1		22.0		
25	5	SS	23.5	25.0	8	12	14	18	ML	14.6			VERY STIFF TO HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE OF FINE SAND.	
30	6	SS	28.5	30.0	12	19	19	18	ML	12.1				
35	7	SS	33.5	35.0	9	12	17	18	ML	12.4				
40	8	SS	38.5	40.0	9	11	14	18	ML	12.7				

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Boring Log

PROJECT No. 81-099
BORING No. B-10
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3313.0 N. AND 53.0 E. OF THE SW CORNER SURFACE ELEV. 586.2
DRILLER CANONIE TEST BORING, WILLIAM HOLLOMAN DATE: START 4-1-82 FINISH 4-5-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6 / 6 12	BLOW COUNT 6 12 / 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
45	9	SS	43.5	45.0	8	13 17	18	ML	11.2				
50	10	SS	48.5	50.0	12	18 23	18	ML	12.6				
55	11	SS	53.5	55.0	8	11 13	18	ML	13.2				
60	12	SS	58.5	60.0	6	3 14	18	ML	15.6			VERY STIFF TO HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND.	
65	13	SS	63.5	65.0	5	8 13	18	ML	20.1				
70	14	SS	68.5	69.8	22	39 100/4	14	ML	16.3				
75	15	SS	73.5	75.0	39	50 80	18	ML	13.3				
80	16	SS	78.5	80.0	40	60 120	18	ML	12.1				

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Boring Log

PROJECT No. 81-099
BORING No. B-10
PAGE 3 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3313.0 N. AND 53.0 E. OF THE SW CORNER SURFACE ELEV. 586.2
DRILLER CANONIE TEST BORING, WILLIAM HOLLOMAN DATE: START 4-1-82 FINISH 4-5-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 TO 6	BLOW COUNT 6 TO 12	BLOW COUNT 12 TO 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
85	17	SS	83.5	84.5	17	200	-	12	-	16.0			HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND.	
												87.5	SOIL TEST BORING REFUSAL AT 87.5 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. B-11
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 2659.0 N. AND 25.0 E. OF THE SW CORNER SURFACE ELEV. 584.7
DRILLER CANONIE TEST BORING, STEVE BERLIN DATE: START 4-5-82 FINISH 4-7-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
5	1	SS	3.5	5.0	3	5	5	8	SC	-			LOOSE GRAY CLAYEY SAND, TRACE OF ORGANIC MATERIAL, SOME FILL MATERIAL.	
												9.0		
10	2	SS	8.5	10.0	3	5	7	12	CL	-				
15	3	SS	13.5	15.0	5	14	24	5	CL	-			STIFF TO HARD GRAY SILTY CLAY, SOME COARSE SAND AND ROCK FRAGMENTS.	
20	4	SS	18.5	20.0	8	14	16	18	CL	-				
25	5	SS	23.5	25.0	8	13	18	18	CL	-				
												27.5		
30	6	SS	28.5	30.0	13	11	14	15	ML	-				
35	7	SS	33.5	35.0	10	17	25	18	ML	-			VERY STIFF TO HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE OF FINE SAND.	
40	8	SS	38.5	40.0	18	24	33	18	ML	-				

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Boring Log

PROJECT No. 81-099
BORING No. B-11
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 2659.0 N. AND 25.0 E. OF THE SW CORNER SURFACE ELEV. 584.7
DRILLER CANONIE TEST BORING, STEVE BERLIN DATE: START 4-5-82 FINISH 4-7-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6 / 6 12	BLOW COUNT 6 12 / 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
45	9	SS	43.5	45.0	20	22 / 40	18	ML	-				
50	10	SS	48.5	49.3	22	27 / 30	18	ML	-			HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE OF FINE SAND.	
55	11	SS	53.5	55.0	15	100/3 / -	9	ML	-			(BOULDER FROM 56.0 FT. TO 57.2 FT.)	
											58.5		
60	12	SS	58.5	59.0	100/6	- / -	0	-	-		61.0	(GRAVEL FROM 58.5 FT. TO 61.0 FT.)	
65	13	SS	63.5	65.0	33	59 / 83	18	ML	-				
70	14	SS	68.5	70.0	23	30 / 45	18	ML	-			HARD GRAY CLAYEY SILT, TRACE OF FINE GRAVEL, TRACE OF COARSE SAND, TRACE OF FINE SAND.	
75	15	SS	73.5	75.0	22	30 / 51	18	ML	-				
80	16	SS	78.5	79.7	35	65 / 100/8	15	ML	-				

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Boring Log

PROJECT No. 81-099
BORING No. B-11
PAGE 3 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 2659.0 N. AND 25.0 E. OF THE SW CORNER SURFACE ELEV. 584.7
DRILLER CANONIE TEST BORING, STEVE BERLIN DATE: START 4-5-82 FINISH 4-7-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
85	17	SS	83.5	85.0	18	22	35	18	ML			85.5	HARD GRAY CLAYEY SILT, TRACE OF FINE GRAVEL, TRACE OF COARSE SAND, TRACE OF FINE SAND.	
													SOIL TEST BORING REFUSAL AT 85.5 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. B-12
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 1997.0 N. AND 88.5 E. OF THE SW CORNER SURFACE ELEV. 583.9
DRILLER CANONIE TEST BORING, STEVE BERLIN DATE: START 4-8-82 FINISH 4-9-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
5	1	SS	3.5	5.0	2	2	3	10	SM	-		6.5	LOOSE GRAY SILTY SAND, TRACE OF ORGANIC MATERIAL, SOME FILL MATERIAL.	
10	2	SS	8.5	10.0	4	5	7	12	CL	18.4				
15	3	SS	13.5	15.0	3	6	7	18	CL	-			STIFF TO VERY STIFF GRAY SILTY CLAY, TRACE OF COARSE TO MEDIUM SAND, SOME FINE SAND.	
20	4	SS	18.5	20.0	5	6	8	10	CL	-				
25	5	SS	23.5	25.0	6	10	12	17	CL	-		28.0		
30	6	SS	28.5	30.0	18	28	34	15	ML	-			HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE OF FINE SAND.	
35	7	SS	33.5	35.0	13	17	19	18	ML	-				
40	8	SS	38.5	40.0	13	21	30	18	ML	-				

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Boring Log

PROJECT No. 81-099
BORING No. B-12
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 1997.0 N. AND 88.5 E. OF THE SW CORNER SURFACE ELEV. 583.9
DRILLER CANONIE TEST BORING, STEVE BERLIN DATE: START 4-8-82 FINISH 4-9-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
45	9	SS	43.5	45.0	20	30	48	18	ML	-			HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE OF FINE SAND.	
50	10	SS	48.5	50.0	13	21	27	18	ML	-		52.0		
55	11	SS	53.5	55.0	19	22	29	18	CL	-			HARD GRAY CLAY, TRACE OF SILT, TRACE OF COARSE SAND, TRACE OF FINE SAND.	
									SW			58.0	VERY DENSE FINE TO COARSE SAND AND	
60	12	SS	58.5	60.0	5	21	41	18	ML	-		59.0	GRAVEL.	
													HARD GRAY CLAYEY SILT, TRACE OF COARSE AND FINE SAND.	
65	13	SS	63.5	65.0	20	31	39	18	ML	-		64.0	HARD GRAY SILT, TRACE OF CLAY.	
70	14	SS	68.5	70.0	15	23	32	18	CL	17.6		65.5	HARD GRAY SILTY CLAY, TRACE OF COARSE TO MEDIUM SAND, SOME FINE SAND.	
75	15	SS	73.5	75.0	22	32	47	18	ML	19.4		72.0	HARD GRAY SILT, TRACE OF CLAY, TRACE OF COARSE SAND.	
80	16	SS	78.5	80.0	31	42	50	18	ML	-				

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Boring Log

PROJECT No. 81-099
BORING No. B-14
PAGE 1 OF 2

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 509.0 N. AND 168.0 E. OF THE SW CORNER SURFACE ELEV. 585.7
DRILLER CANONIE TEST BORING, JERRY HAMMAN DATE: START 3-22-82 FINISH 3-23-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
5	1	SS	3.5	5.0	7	5	3	5	-	-		6.0	SLAG, SAND (FILL MATERIAL).	
10	2	SS	8.5	10.0	2	2	4	18	SM	-		11.0	LOOSE FINE TO MEDIUM BLACK AND BROWN SILTY SAND.	
15	3	SS	15.0	16.5	7	7	8	2	CL	-			STIFF TO HARD GRAY SILTY CLAY, TRACE OF FINE TO COARSE SAND.	
20	4	SS	20.0	21.5	3	6	8	18	CL	-				
25	5	SS	25.0	26.5	6	21	26	18	ML-CL	-		25.5		
30	6	SS	30.0	31.5	16	24	35	18	ML	-				
35	7	SS	35.0	36.5	11	14	23	18	ML	-			HARD GRAY CLAYEY SILT, TRACE TO SOME FINE TO COARSE SAND.	
40	8	SS	40.0	41.5	13	23	39	18	ML	-				

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Boring Log

PROJECT No. 81-099
BORING No. R-14
PAGE 2 OF 2

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 509.0 N. AND 168.0 E. OF THE SW CORNER SURFACE ELEV. 585.7
DRILLER CANONIE TEST BORING, JERRY HAMMAN DATE: START 3-22-82 FINISH 3-23-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
45	9	SS	45.0	46.5	12	21	34	18	ML	-				
50	10	SS	50.0	51.3	23	63	100/3	15	ML	-				
55	11	SS	55.0	56.5	12	22	30	18	ML	-			HARD GRAY CLAYEY SILT, TRACE OF FINE TO COARSE SAND.	
60	12	SS	60.0	61.5	9	20	26	18	ML	23.7				
65	13	SS	65.0	66.5	11	25	29	18	ML	-				
70	14	SS	70.0	71.5	17	27	50	18	ML	-				
75	15	SS	75.0	75.8	85	100/4	-	10	ML	-		78.0	SOIL TEST BORING REFUSAL AT 78.0 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. B-15
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 117.0 N. AND 712.0 E. OF THE SW CORNER SURFACE ELEV. 589.0
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-15-82 FINISH 3-16-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PID
5	1	SS	3.5	5.0	10	5	6	0	-	-			SLAG AND CINDERS (FILL MATERIAL).	
10	2	SS	8.5	10.0	18	46	9	3	-	14.8		12.0		
15	3	SS	13.5	15.0	7	14	17	18	CL	22.5				
20	4	ST	18.5	20.5	-	-	-	-	CL	-			HARD GRAY CLAY, TRACE OF SILT, TRACE OF FINE SAND.	
25	5	SS	23.5	25.0	12	18	22	18	CL	22.6				
30	6	SS	28.5	30.0	12	22	34	1	CL	-		32.0		
35	7	SS	33.5	35.0	21	26	29	18	ML	16.9			HARD GRAY CLAYEY SILT, TRACE OF FINE GRAVEL, TRACE OF COARSE TO MEDIUM SAND, SOME FINE SAND.	
40	8	SS	38.5	40.0	48	66	84	18	ML	12.1				

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Boring Log

PROJECT No. 81-099
BORING No. B-15
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 117.0 N. AND 712.0 E. OF THE SW CORNER SURFACE ELEV. 589.0
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-15-82 FINISH 3-16-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0-6	BLOW COUNT 6-12	BLOW COUNT 12-18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIE.
45	9	SS	43.5	45.0	23	48	70	14	CL	13.3				
										14.5				
50	10	SS	48.5	50.0	37	52	90	18	ML	12.7				
55	11	SS	53.5	54.3	93	100/4	–	5	ML	12.9				
										14.0			HARD GRAY CLAYEY SILT, TRACE OF FINE GRAVEL, TRACE OF COARSE TO MEDIUM SAND, SOME FINE SAND.	
60	12	SS	58.5	60.0	31	51	100/5	18	ML	11.7				
65	13	SS	63.5	65.0	37	70	100	18	ML	15.6				
70	14	SS	68.5	69.7	40	70	100/3.5	15.5	ML-CL	12.2				
75	15	SS	73.5	75.0	43	60	80	18	ML	15.0				
80	16	SS	78.5	80.0	43	60	98	18	ML	14.4				

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Boring Log

PROJECT No. 81-099
BORING No. B-15
PAGE 3 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 117.0 N. AND 712.0 E. OF THE SW CORNER SURFACE ELEV. 589.0
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-15-82 FINISH 3-16-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
85	17	SS	83.0	84.0	60	100	-	6	ML	13.6		86.0	HARD GRAY SANDY SILT, TRACE OF CLAY.	
													SOIL TEST BORING REFUSAL AT 86.0 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. B-16
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 108.0 N. AND 1265.0 E. OF THE SW CORNER SURFACE ELEV. 589.9
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-16-82 FINISH 3-18-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
5	1	SS	3.5	5.0	30	21	30	-	-	15.1		7.0	SLAG, SAND, AND GRAVEL (FILL MATERIAL).	
10	2	SS	8.5	10.0	6	5	3	3	SM	-			LOOSE TO DENSE BROWN FINE SAND, TRACE OF SILT.	
15	3	SS	13.5	15.0	9	15	16	-	SM	26.6		17.0		
20	4	SS	18.5	20.0	9	13	18	-	CL	21.1			VERY STIFF TO HARD GRAY SILTY CLAY.	
25	5	SS	23.5	25.0	13	13	16	-	CL	18.4				
30	6	SS	28.5	30.0	7	14	20	-	CL	20.9		32.0		
35	7	SS	33.5	35.0	17	36	62	-	ML	21.2			HARD GRAY CLAYEY SILT, TRACE OF FINE TO COARSE SAND.	
40	8	SS	38.5	40.0	16	30	57	-	ML	12.4				

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Boring Log

PROJECT No. 81-099
BORING No. B-16
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 108.0 N. AND 1265.0 E. OF THE SW CORNER SURFACE ELEV. 589.9
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-16-82 FINISH 3-18-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
45	9	SS	43.5	45.0	23	27	46	-	ML	13.9				
50	10	SS	48.5	50.0	30	35	53	-	ML	12.8			HARD GRAY CLAYEY SILT, TRACE OF FINE TO COARSE SAND.	
55	11	SS	53.5	55.0	31	43	46	-	ML	12.5				
60	12	SS	58.5	60.0	62	64	100/6	17	ML	12.3				
												62.0	(VERY DENSE MEDIUM TO COARSE SAND SEAM AT 62 FT., LESS THAN SIX-INCHES THICK.)	
65	13	SS	63.5	64.8	33	81	100/6	18	ML	-			HARD GRAY SILT, TRACE OF CLAY, TRACE OF FINE TO COARSE SAND, (SAND SEAM AT 68 FT.)	
70	14	SS	68.5	69.2	80	100/3	-	8	ML	9.4		69.2		
75	15	SS	73.5	75.0	36	78	94	0	-	-			HARD GRAY SILT, TRACE OF CLAY, SOME COARSE SAND AND FINE GRAVEL.	
80	16	SS	78.5	80.0	34	61	62	8	ML	22.4				

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Boring Log

PROJECT No. 81-099
BORING No. R-16
PAGE 3 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 108.0 N. AND 1265.0 E. OF THE SW CORNER SURFACE ELEV. 589.9
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-16-82 FINISH 3-18-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 TO 6	BLOW COUNT 6 TO 12	BLOW COUNT 12 TO 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
85	17	SS	83.5	85.0	31	42	48	18	ML	19.8			HARD GRAY SILT, TRACE OF CLAY, TRACE OF COARSE SAND.	
90	18	SS	88.5	90.0	40	73	100/5	12	ML	24.2		91.0	SOIL TEST BORING REFUSAL AT 91.0 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. B-17
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 54.3 N. AND 1830.7 E. OF THE SW CORNER SURFACE ELEV. 588.4
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 4-1-82 FINISH 4-1-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0-6	BLOW COUNT 6-12	BLOW COUNT 12-18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
													SLAG, SAND, 100% WATER LOSS AT 2.5 FT. (FILL MATERIAL)	
												2.5		
5	1	SS	3.5	5.0	4	2	4	1	SM	-			LOOSE TO VERY FIRM BROWN FINE SAND, SOME SILT.	
10	2	SS	8.5	10.0	8	10	13	12	SM	-		10.5		
15	3	SS	13.5	15.0	22	82	16	11	CL	-				
20	4	SS	18.5	20.0	12	17	25	2	CL	-			HARD GRAY CLAY, TRACE OF FINE TO COARSE SAND, TRACE OF SILT, TRACE OF FINE GRAVEL.	
25	5	SS	23.5	25.0	8	12	19	18	CL	-				
30	6	SS	28.5	30.0	12	19	23	12	CL	-		32.0		
35	7	SS	33.5	35.0	35	41	63	12	ML	-			HARD GRAY CLAYEY SILT, TRACE TO SOME FINE SAND.	
40	8	SS	38.5	40.0	16	23	32	12	ML	-				

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Boring Log

PROJECT No. 81-099
BORING No. R-17
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 54.3 N. AND 1830.7 E. OF THE SW CORNER SURFACE ELEV. 588.4
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 4-1-82 FINISH 4-1-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
45	9	SS	43.5	45.0	23	32	39	18	ML	-				
50	10	SS	48.5	50.0	22	39	39	18	ML	-				
55	11	SS	53.5	55.0	30	32	61	12	ML	-			HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE TO SOME FINE SAND, TRACE OF FINE GRAVEL.	
60	12	SS	58.5	60.0	33	36	56	12	ML	-				
65	13	SS	63.5	65.0	28	40	54	12	ML	-				
70	14	SS	68.5	70.0	30	39	61	12	ML	-				
75	15	SS	73.5	75.0	56	74	81	18	ML					
80	16	SS	78.5	80.0	22	35	63	18	ML					

CanonieEngineers

Boring Log

PROJECT No. 81-099
BORING No. B-17
PAGE 3 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 54.3 N. AND 1830.7 E. OF THE SW CORNER SURFACE ELEV. 588.4
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 4-1-82 FINISH 4-1-82

DEPTH	SAMPLE No.	SAMPLE TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0-6	BLOW COUNT 6-12	BLOW COUNT 12-18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
												83.5	HARD GRAY SILTY CLAY, TRACE OF FINE SAND AND GRAVEL.	
85	17	SS	83.5	85.0	13	16	44	18	CL			85.0		
													HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE OF FINE SAND, TRACE OF FINE GRAVEL. 3 INCH SEAM OF FINE TO COARSE SAND AND GRAVEL AT 89.3 FT. 8 INCH GRAY SILT SEAM.	
90	18	SS	88.5	90.0	25	41	72	18	ML					
												94.2	(BOULDER AT 90.5 FT.) (GRAVEL AT 91.5 FT., 92 FT., 93.2 FT.)	
													SOIL TEST BORING REFUSAL AT 94.2 FT., BORING TERMINATED.	
													NOTE: BLOW COUNTS FROM SAMPLE NUMBERS 15 TO 18 WERE OBTAINED FROM A 350 LB. WEIGHT DROPPED 17 INCHES, DRIVING A 3 INCH SPLIT-SPOON SAMPLER.	

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Boring Log

PROJECT No. 81-099
BORING No. B-18
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 341.0 N. AND 2430.0 E. OF THE SW CORNER SURFACE ELEV. 586.2
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-18-82 FINISH 3-19-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6 6 12	BLOW COUNT 6 12 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS
5	1	SS	3.5	4.2	58	100/2 -	8	-	74.5		6.0	SLAG, SAND (FILL MATERIAL).
											8.0	PEAT
10	2	SS	8.5	10.0	10	17 18	18	SP-SM	24.9		12.0	MEDIUM DENSE BROWN SILTY FINE SAND, TRACE OF ORGANIC MATERIAL.
15	3	SS	13.5	15.0	17	25 31	18	ML-CL	16.0	2.5		VERY STIFF GRAY CLAYEY SILT, TRACE OF COARSE TO FINE SAND, TRACE OF FINE GRAVEL.
20	4	SS	18.5	20.0	19	30 31	12	ML	15.6	3.4	22.0	
25	5	SS	23.5	25.0	10	19 18	18	CL	21.8	3.3		
30	6	SS	28.5	30.0	16	26 32	18	CL	20.8	1.6		STIFF TO VERY STIFF GRAY SILTY CLAY, TRACE OF COARSE SAND AND FINE GRAVEL, SOME MEDIUM TO FINE SAND.
35	7	SS	33.5	35.0	29	40 50	0	-	-			
40	8	SS	38.5	40.0	19	28 37	-	ML	13.6	3.7		

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Boring Log

PROJECT No. 81-099
BORING No. R-18
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 341.0 N. AND 2430.0 E. OF THE SW CORNER SURFACE ELEV. 586.2
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-18-82 FINISH 3-19-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
												42.0		
45	9	SS	43.5	45.0	35	47	57	-	ML	11.8				
50	10	SS	48.5	50.0	32	53	70	-	ML	11.7				
										13.5				
55	11	SS	53.5	55.0	47	81	100/5	18	ML	11.0				
60	12	SS	58.5	60.0	24	44	45	18	ML	10.1			HARD GRAY CLAYEY SILT, TRACE OF FINE AND COARSE SAND, TRACE OF ROCK FRAGMENTS.	
65	13	SS	63.5	65.0	29	40	59	18	ML	12.2				
70	14	SS	68.5	70.0	24	57	68	18	ML	12.4				
75	15	SS	73.5	75.0	31	41	64	0	-	-				
80	16	SS	78.5	80.0	24	36	34	3	ML	-				

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Boring Log

PROJECT No. 81-099
BORING No. R-18
PAGE 3 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 341.0 N. AND 2430.0 E. OF THE SW CORNER SURFACE ELEV. 586.2
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-18-82 FINISH 3-19-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
85	17	SS	83.5	85.0	29	63	84	6	ML	-			HARD GRAY CLAYEY SILT, TRACE OF FINE AND COARSE SAND, TRACE OF ROCK FRAGMENTS.	
90	18	SS	88.5	90.0	24	64	69	4	ML	-				
95	19	SS	93.5	93.8	100/4	-	-	3	ML	-		94.3	SOIL TEST BORING REFUSAL AT 94.3 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. B-19
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 953.0 N. AND 2334.0 E. OF THE SW CORNER SURFACE ELEV. 586.5
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-23-82 FINISH 3-24-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6 / 6 12	BLOW COUNT 6 12 / 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
5	1	SS	3.5	4.1	31	100/1	7	-	-		6.5	BLUE SLAG (FILL MATERIAL).	
											7.5	PEAT	
10	2	SS	8.5	10.0	10	11 22	18	SP-SM	-		11.5	DENSE GRAY FINE SAND, SOME SILT.	
15	3	SS	13.5	15.0	9	13 21	18	CL	-	1.4			
20	4	SS	18.5	20.0	9	12 14	18	CL	-	1.2		VERY STIFF TO HARD, GRAY SILTY CLAY, TRACE OF FINE AND COARSE SAND.	
25	5	SS	23.5	25.0	10	14 17	18	CL	-	1.6			
30	6	SS	28.5	30.0	13	17 26	18	CL	-	2.4	32.0		
35	7	SS	33.5	35.0	37	61 62	18	ML-CL	12.1			HARD GRAY SANDY SILT, TRACE OF CLAY, TRACE OF FINE GRAVEL AND COARSE SAND, SOME MEDIUM TO FINE SAND.	
40	8	SS	38.5	40.0	25	30 39	18	ML	-				

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Boring Log

PROJECT No. 81-099
BORING No. B-19
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 953.0 N. AND 2334.0 E. OF THE SW CORNER SURFACE ELEV. 586.5
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-23-82 FINISH 3-24-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 TO 6	BLOW COUNT 6 TO 12	BLOW COUNT 12 TO 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
45	9	SS	43.5	45.0	32	62	65	14	ML	-			HARD GRAY SANDY SILT, TRACE OF CLAY, TRACE OF FINE AND COARSE SAND.	
50	10	SS	48.5	50.0	35	69	73	16	ML	-		52.0		
55	11	SS	53.5	55.0	40	65	80	-	ML	-				
60	12	SS	58.5	60.0	47	74	92	18	ML	-				
65	13	SS	63.5	65.0	40	58	64	18	ML	-			HARD GRAY CLAYEY SILT, TRACE OF FINE AND COARSE SAND, TRACE OF FINE TO COARSE GRAVEL.	
70	14	SS	68.5	70.0	22	36	41	18	ML	-				
75	15	SS	73.5	75.0	20	32	43	18	ML	-				
80	16	SS	78.5	80.0	27	35	42	0	-	-				

CanonieEngineers

Boring Log

PROJECT No. 81-099
BORING No. R-19
PAGE 3 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 953.0 N. AND 734.0 E. OF THE SW CORNER SURFACE ELEV. 586.5
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-23-82 FINISH 3-24-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0-6	BLOW COUNT 6-12	BLOW COUNT 12-18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
85	17	SS	83.5	85.0	37	52	68	18	ML	-			HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND.	
90	18	SS	88.5	90.0	18	28	43	18	ML	-				
95	19	SS	93.5	95.0	62	69	47	12	ML	-		96.0		
												98.0	VERY DENSE FINE TO COARSE GRAVEL.	
100	20	SS	98.0	98.0	100/0	-	-	0	-	-			SOIL TEST BORING REFUSAL AT 98.0 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. B-20
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 1760.0 N. AND 2616.0 E. OF THE SW CORNER SURFACE ELEV. 586.4
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 4-27-82 FINISH 4-28-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 TO 6	BLOW COUNT 6 TO 12	BLOW COUNT 12 TO 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
5										23.1		7.0	SLAG, (FILL MATERIAL).	
	1	SS	6.5	8.0	24	19	22	4	-					
10												13.0	DENSE GRAY FINE SAND, TRACE OF SILT.	
15	1	ST	13.0	15.5	-	-	-	-	-	-				
20	2	ST	18.5	20.5	-	-	-	-	-	-			HARD GRAY CLAY, TRACE OF FINE TO COARSE SAND, TRACE OF SILT.	
25	3	ST	23.5	25.5	-	-	-	-	-	-				
30	2	SS	28.5	30.0	15	30	40	16	CL	20.6		33.0		
35	3	SS	33.5	35.0	15	24	37	12	ML	-			HARD GRAY CLAYEY SILT AT 35 FT.	
40	4	SS	38.5	40.0	28	47	58	14	ML	11.2				

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Boring Log

PROJECT No. 81-099
BORING No. B-20
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 1760.0 N. AND 2616.0 E. OF THE SW CORNER SURFACE ELEV. 586.4
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 4-27-82 FINISH 4-28-82

DEPTH	SAMPLE No.	SAMPLE TYPE	INTERVAL FROM	INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
45	5	SS	43.5	45.0	28	57	47	18	ML	13.4			(BOULDER AT 48 FT.)	
50	6	SS	48.5	50	35	44	54	14	ML	12.7			HARD GRAY SANDY SILT, TRACE OF CLAY, TRACE OF COARSE SAND, TRACE OF FINE GRAVEL.	
55	7	SS	53.5	55.0	34	55	74	14	ML	13.2				
60	8	SS	58.5	60.0	43	62	65	12	ML	14.7		62.0		
65	9	SS	63.5	65.0	21	28	37	18	CL	21.7			HARD GRAY SILTY CLAY AND FINE SAND, SOME COARSE TO MEDIUM SAND, SOME FINE TO COARSE GRAVEL.	
70	10	SS	68.5	70.0	24	46	46	16	GM	-				
75	11	SS	73.5	.0	21	31	55	12	CL	14.5		77.0		
80	12	SS	78.5	80.0	38	39	44	12	ML	14.2			HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND.	

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Boring Log

PROJECT No. 81-099
BORING No. B-20
PAGE 3 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 1760.0 N. AND 2616.0 E. OF THE SW CORNER SURFACE ELEV. 586.4
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 4-27-82 FINISH 4-28-82

DEPTH	SAMPLE No	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6 / 6 12	BLOW COUNT 6 12 / 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
85	13	SS	83.5	85.0	30	46 / 52	10	ML	17.3			HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE OF FINE GRAVEL.	
90	14	SS	88.5	90.0	52	48 / 56	14	ML	13.6		92.5		
95	15	SS	93.5	95.0	26	59 / 83	18	ML	-		97.0	GRAY CLAYEY SILT, SOME FINE TO COARSE GRAVEL.	
100												SOIL TEST BORING REFUSAL AT 97.0 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. R-22
PAGE 1 OF 2

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3250.0 N. AND 2522.0 E. AT THE SW CORNER SURFACE ELEV. 587.3
DRILLER CANONIE TEST BORING, WILLIAM HOLLOMAN DATE: START 4-19-82 FINISH 4-19-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
5	1	SS	3.5	5.0	2	2	4	6	-	18.7			(FILL MATERIAL)	
10	2	SS	8.5	10.0	3	7	7	12	SM	21.4		9.5	MEDIUM DENSE GRAY FINE SILTY SAND.	
15	3	SS	13.5	15.0	2	3	5	18	CL	21.8		13.0		
20	4	SS	18.5	20.0	2	4	7	18	CL	25.0			MEDIUM STIFF TO HARD GRAY SILTY CLAY, TRACE OF FINE TO COARSE SAND.	
25	5	SS	23.5	25.0	4	5	11	18	CL	21.9				
30	6	ST	28.5	31.0	-	-	-	25	-	-		32.0		
35	7	SS	33.5	35.0	11	15	22	18	ML-CL	14.0			HARD GRAY CLAYEY SILT, TRACE TO SOME FINE AND COARSE SAND, SOME FINE GRAVEL.	
40	8	SS	38.5	40.0	16	18	23	-	ML	14.0				

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Boring Log

PROJECT No. 81-099
BORING No. B-22
PAGE 2 OF 2

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3250.0 N. AND 2522.0 E. AT THE SW CORNER SURFACE ELEV. 587.3
DRILLER CANONIE TEST BORING, WILLIAM HOLLOMAN DATE: START 4-19-82 FINISH 4-19-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0-6	BLOW COUNT 6-12	BLOW COUNT 12-18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
45	9	SS	43.5	45.0	17	26	40	18	ML	13.5			HARD GRAY CLAYEY SILT, SOME FINE TO COARSE SAND, SOME FINE GRAVEL.	
50	10	SS	48.5	50.0	25	26	40	18	ML-CL	14.7				
55	11	SS	53.5	54.3	55	100/4	-	10	ML	11.0		56.0		
	12	SS	58.5	58.8	100/4	-	-	4	GP-ML	16.3		59.0	DENSE COARSE GRAVEL, GRAY SILT AND CLAY.	
60													SOIL TEST BORING REFUSAL AT 59.0 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. R-23
PAGE 1 OF 2

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3237.0 N. AND 1858.0 E. OF THE SW CORNER SURFACE ELEV. 586.5
DRILLER CANONIE TEST BORING, STEVE BERLIN DATE: START 4-14-82 FINISH 4-14-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
5	1	SS	3.5	5.0	1	1	1	3	SC	30.9		8.0	SLAG, CLAYEY SAND, AND ORGANIC MATERIAL (FILL MATERIAL).	
10	2	SS	8.5	10.0	7	6	7	18	SP-SM	28.2		13.0	MEDIUM DENSE GRAY FINE SAND, TRACE OF SILT.	
15	3	SS	13.5	15.0	3	6	8	18	CL	20.2		17.0	VERY STIFF GRAY CLAY, TRACE OF FINE AND COARSE SAND.	
20	4	SS	18.5	20.0	5	9	12	18	ML	-				
25	5	SS	23.5	25.0	6	10	21	18	ML	-				
30	6	SS	28.5	30.0	8	13	24	18	ML	16.3			VERY STIFF TO HARD GRAY CLAYEY SILT, TRACE OF COARSE TO MEDIUM SAND, TRACE OF FINE GRAVEL, SOME FINE SAND.	
35	7	SS	33.5	35.0	8	18	16	18	ML	11.3				
40	8	SS	38.5	40.0	12	12	21	18	ML	11.6				

CanonieEngineers

Boring Log

PROJECT No. 81-099
BORING No. B-23
PAGE 2 OF 2

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 3237.0 N. AND 1858.0 E. OF THE SW CORNER SURFACE ELEV. 586.5
DRILLER CANONIE TEST BORING, STEVE BERLIN DATE: START 4-14-82 FINISH 4-14-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6 / 6 12	BLOW COUNT 6 12 / 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
45	9	SS	43.5	45.0	10	13 / 17	18	ML-CL	-				
50	10	SS	48.5	50.0	10	32 / 48	18	ML	-			VERY STIFF TO HARD GRAY CLAYEY SILT, TRACE OF COARSE TO MEDIUM SAND, SOME FINE SAND, TRACE OF FINE GRAVEL.	
55	11	SS	53.5	55.0	21	27 / 39	18	ML	10.3				
60	12	SS	58.5	60.0	17	19 / 22	18	ML	10.6				
65	13	SS	63.5	63.6	100/1	- / -	1	-	-		64.5	SOIL TEST BORING REFUSAL AT 64.5 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. R-24
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 2854.0 N. AND 1255.0 E. OF THE SW CORNER SURFACE ELEV. 592.9
DRILLER CANONIE TEST BORING, STEVE BERLIN DATE: START 4-12-82 FINISH 4-13-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6 / 6 12	BLOW COUNT 6 12 / 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
5	1	SS	3.5	5.0	17	24 23	12	-	11.0			SAND, SLAG, WOOD, BRICK (FILL MATERIAL).	
10	2	SS	8.5	10.0	3	8 10	4	-	-		14.0		
15	3	SS	13.5	15.0	7	6 13	8	CL	23.0			VERY STIFF TO HARD GRAY SILTY CLAY, TRACE OF ORGANIC MATERIAL, SOME FINE SAND, TRACE OF MEDIUM TO COARSE SAND, TRACE OF FINE GRAVEL.	
20	4	SS	18.5	20.0	6	8 12	9.5	ML-CL	22.6				
25	5	SS	23.5	25.0	6	9 12	12	ML-CL	18.5				
30	6	SS	28.5	30.0	21	11 14	18	ML-CL	17.7		33.0		
35	7	SS	33.5	35.0	4	13 14	18	ML	14.0			VERY STIFF TO HARD GRAY CLAYEY SILT, TRACE OF FINE AND COARSE SAND, TRACE OF FINE GRAVEL.	
40	8	SS	38.5	40.0	18	29 24	10	ML	13.6				

CanonieEngineers

Boring Log

PROJECT No. 81-099
BORING No. B-24
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 2854.0 N. AND 1255.0 E. OF THE SW CORNER SURFACE ELEV. 592.9
DRILLER CANONIE TEST BORING, STEVE BERLIN DATE: START 4-12-82 FINISH 4-13-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
45	9	SS	43.5	45.0	8	12	16	16	ML	13.2				
50	10	SS	48.5	50.0	12	18	29	18	ML-CL	12.5				
55	11	SS	53.5	55.0	10	15	21	18	ML-CL	12.9				
60	12	SS	58.5	60.0	12	18	24	18	ML-CL	13.2			VERY STIFF TO HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE OF FINE GRAVEL, TRACE OF ROCK FRAGMENTS, SOME FINE TO MEDIUM SAND.	
65	13	SS	63.5	65.0	4	13	12	18	ML-CL	14.8				
70	14	SS	68.5	70.0	16	30	36	18	ML-CL	-				
75	15	SS	73.5	75.0	12	37	45	18	ML-CL	10.9				
80	16	SS	78.5	80.0	20	26	37	18	ML-CL	9.4				

CanonieEngineers

Boring Log

PROJECT No. 81-099
BORING No. B-24
PAGE 3 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 2854.0 N. AND 1255.0 E. OF THE SW CORNER SURFACE ELEV. 592.9
DRILLER CANONIE TEST BORING, STEVE BERLIN DATE: START 4-12-82 FINISH 4-13-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL GROUP SYMBOL	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
85	17	SS	83.5	85.0	29	45	58	16	ML-CL	9.0			HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND, TRACE OF FINE GRAVEL, ROCK FRAGMENTS, SOME FINE TO MEDIUM SAND.	
												87.5		
90													SOIL TEST BORING REFUSAL AT 87.5 FT., BORING TERMINATED.	

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Boring Log

PROJECT No. 81-099
BORING No. B-26
PAGE 1 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 1064.0 N. AND 1461.0 E. OF THE SW CORNER SURFACE ELEV. 587.9
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-24-82 FINISH 3-25-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 TO 6	BLOW COUNT 6 TO 12	BLOW COUNT 12 TO 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
5	1	SS	3.5	5.0	16	14	2	3	-	-				
10	2	SS	8.5	10.0	1	3	2	2	-	-			GRAVEL, SLAG (FILL MATERIAL).	
15	3	SS	13.5	15.0	7	10	10	0	-	-		16.5		
20	4	SS	18.5	20.0	24	17	28	4	CL	-			HARD GRAY CLAY, TRACE OF SILT, TRACE OF FINE AND COARSE SAND.	
25	5	SS	23.5	25.0	8	15	19	18	CL	-				
30	6	SS	28.5	30.0	12	19	27	18	CL	-		31.5		
35	7	SS	33.5	35.0	30	58	56	0	ML	-			HARD GRAY CLAYEY SILT, TRACE OF COARSE SAND.	
40	8	SS	38.5	40.0	19	28	31	-	ML	-				

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Boring Log

PROJECT No. 81-099
BORING No. B-26
PAGE 2 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 1064.0 N. AND 1461.0 E. OF THE SW CORNER SURFACE ELEV. 587.9
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-24-82 FINISH 3-25-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0 6	BLOW COUNT 6 12	BLOW COUNT 12 18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
45	9	SS	43.5	45.0	32	45	76	18	ML	-			HARD GRAY CLAYEY SILT, TRACE OF COARSE TO MEDIUM SAND, SOME FINE SAND.	
50	10	SS	48.5	50.0	46	77	100/3	15	ML	11.5				
												54.0		
55	11	SS	53.5	55.0	45	100/3	-	10	ML	-				
60	12	SS	58.5	60.0	34	57	68	18	ML	-				
65	13	SS	63.5	65.0	31	42	59	18	ML	-			HARD DARK GRAY CLAYEY SILT, TRACE TO SOME COARSE TO FINE SAND, TRACE OF ROCK FRAGMENTS.	
70	14	SS	68.5	70.0	26	44	54	18	ML	-				
75	15	SS	73.5	75.0	31	66	38	0	-	-				
80	16	SS	78.5	80.0	32	48	48	18	ML	-				

CanonieEngineers

Boring Log

PROJECT No. 81-099
BORING No. B-26
PAGE 3 OF 3

PROJECT NAME WASTE MANAGEMENT - INTERLAKE
BORING LOCATION 1064.0 N. AND 1461.0 E. OF THE SW CORNER SURFACE ELEV. 587.9
DRILLER RAIMONDE DRILLING, ANGELO RAIMONDE DATE: START 3-24-82 FINISH 3-25-82

DEPTH	SAMPLE No.	SAMPLE TYPE	SAMPLE INTERVAL FROM	SAMPLE INTERVAL TO	BLOW COUNT 0-6	BLOW COUNT 6-12	BLOW COUNT 12-18	RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
												82.0		
85	17	SS	83.5	85.0	32	47	54	18	CL	-			HARD GRAY CLAY, TRACE OF SILT, TRACE OF FINE SAND. (GRAVEL AT 87 FT.)	
90	18	SS	93.5	93.5	100/0	-	-	0	CL	-				
												93.5	SOIL TEST BORING REFUSAL AT 93.5 FT., BORING TERMINATED.	